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58TH ANNUAL CONVENTION, A.O.A.—TORONTO, CANADA—JULY 12-16

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1. The Physiological Basis of Medical Practice. 1945, p. 486.
2. New England J. Med. 235:80, July 18, 1946.

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Brown, E.M., Frain, J.B., Udell, L. and Hollander, J.L., *Am. J. Med.* **15**:656-665, Nov. 1953.

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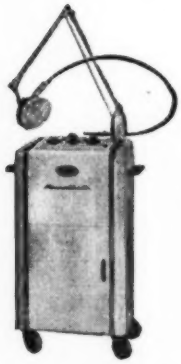

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SUPPLIED: Bottles of 3 fl. oz. and 16 fl. oz. through all pharmacies. *Literature and Samples on Request.*

1. Crunden, A. B., Jr., and Davis, W. A.: Am. J. Obst. & Gynec. 65:311, 1953.

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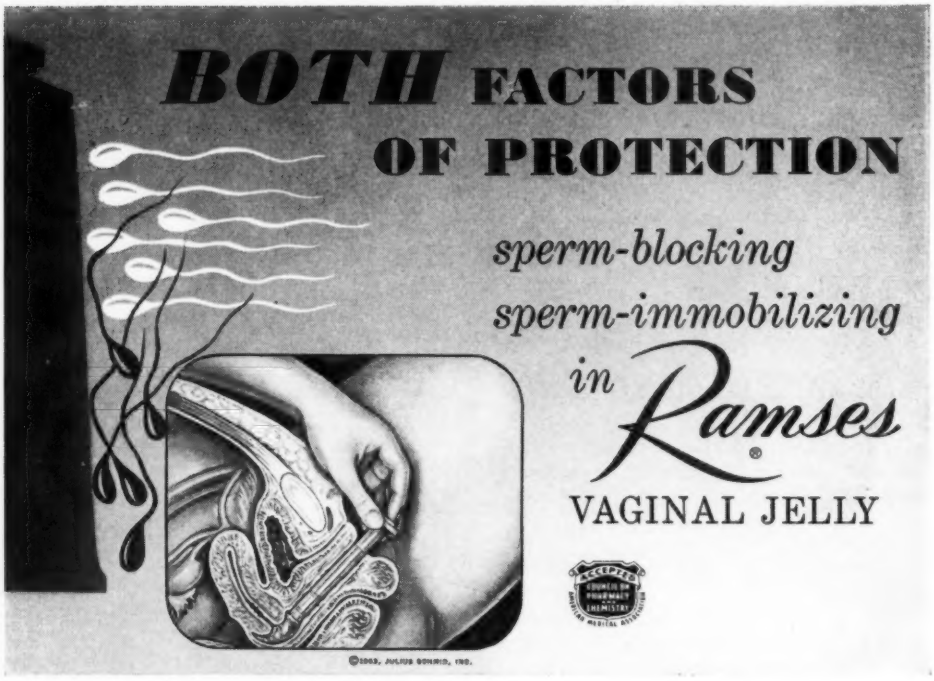

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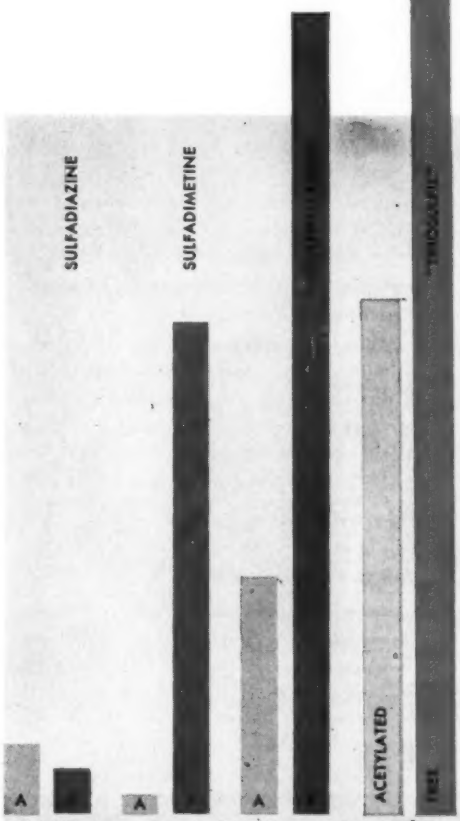

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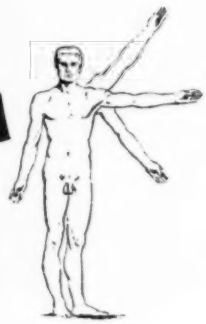

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1. De Lucia and Strosberg, Med. Times 82:1, p. 47, 1954.

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That enriched bread has a place in the modern reducing diet is evidenced by its inclusion in many weight reduction programs recommended by authorities in the fields of metabolism and internal medicine. Such a diet has recently been included in a pamphlet published by one of the nationwide organizations concerned with national health and the increasing problem of obesity.

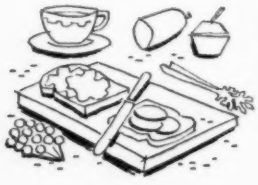
This diet, a conventional reducing diet providing 1,200 to 1,400 calories per day, allows a balanced variety of basic foods including bread. Note the sample menu.

Enriched bread is far more than just a carbohydrate food, as is often the mistaken concept. Moreover, in itself, it is not a "fattening food," since only the calorically excessive diet can induce increase in body weight. Three slices of enriched bread provide only 189 calories, yet this amount makes a worthwhile contribution of biologically applicable protein, B group vitamins, and valuable minerals including iron and calcium. Of even greater importance to the person dieting is the gustatory attractiveness which bread lends to the meal.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

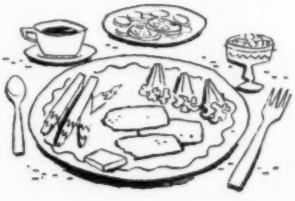
BREAKFAST

4 ounces tomato juice
1 boiled egg — 1 slice of toast
1 teaspoon butter — Coffee with milk



LUNCH

Liverwurst sandwich
(1 ounce meat, mustard, lettuce)
Celery — Small bunch grapes
1 cup of milk



DINNER

Roast chicken (3 slices, or 3 ounces)
Broccoli — 1 teaspoon butter
Asparagus — Fresh fruit cup
Tomato-cucumber salad, vinegar — Coffee or tea with milk

BEDTIME

Orange or ½ banana — ½ cup milk

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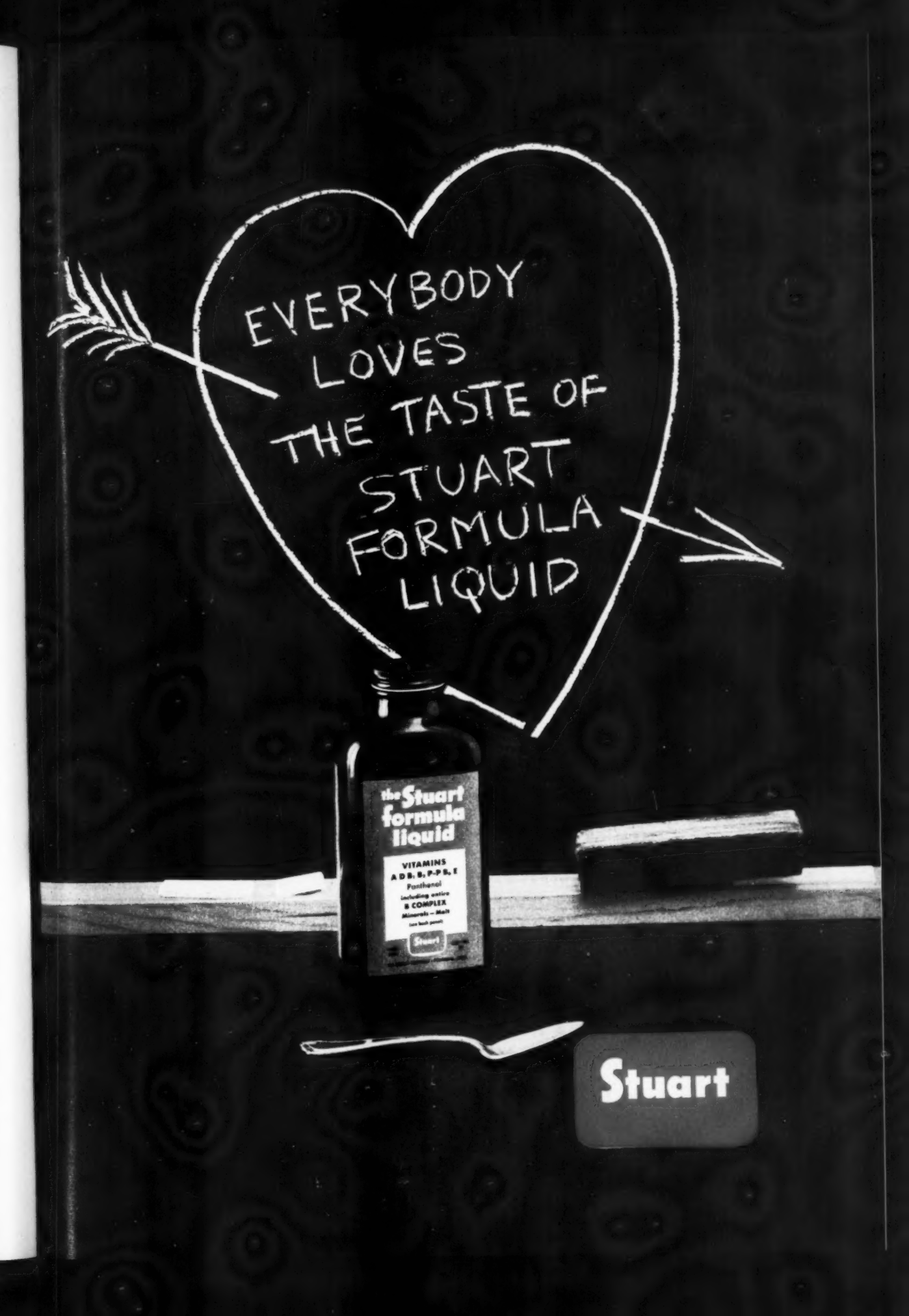
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*Slaughter, D., Grover, W. C., and Hawkins, R.: Report to American Therapeutic Society, Boston, 1950; S. Dakota J. Med. & Pharm., 3:357, 1950.

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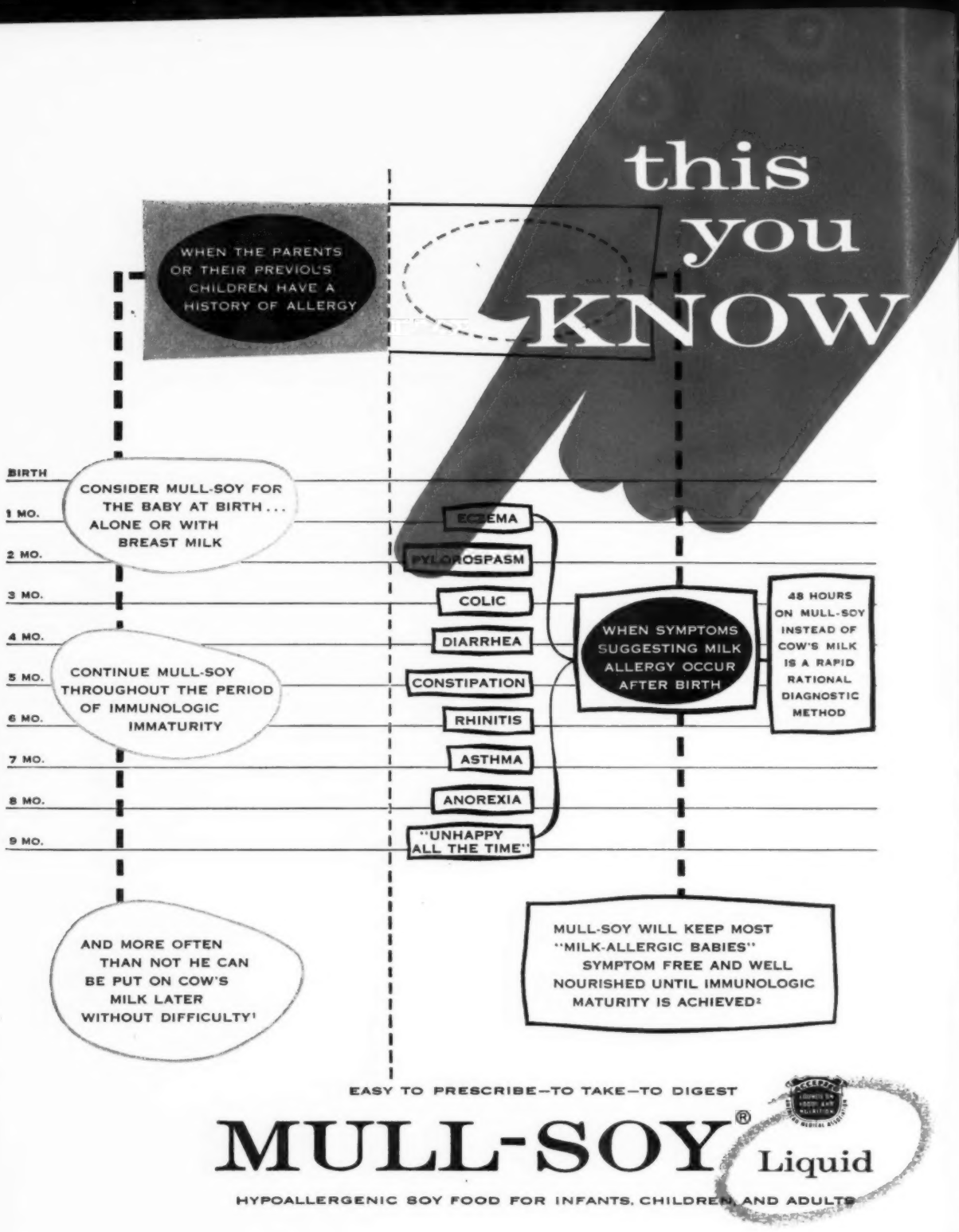
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CONSIDER MULL-SOY FOR THE BABY AT BIRTH... ALONE OR WITH BREAST MILK
CONTINUE MULL-SOY THROUGHOUT THE PERIOD OF IMMUNOLOGIC IMMATURITY
AND MORE OFTEN THAN NOT HE CAN BE PUT ON COW'S MILK LATER WITHOUT DIFFICULTY[1]
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1. Clein, N. W.: Ann. Allergy 9:195, 1951.

2. Glaser, J., and Johnstone, D. E.: Ann. Allergy 10:433, 1952.

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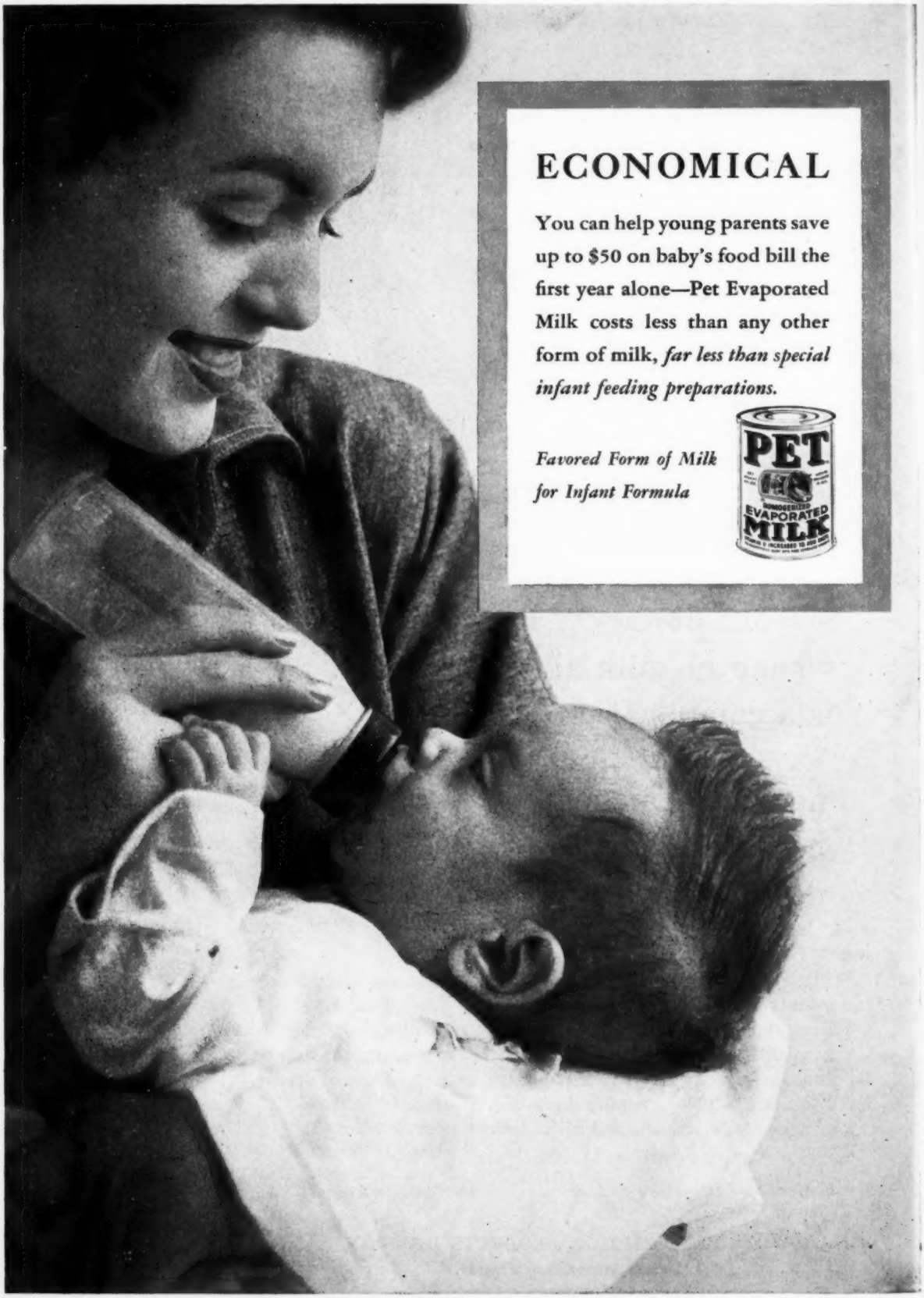
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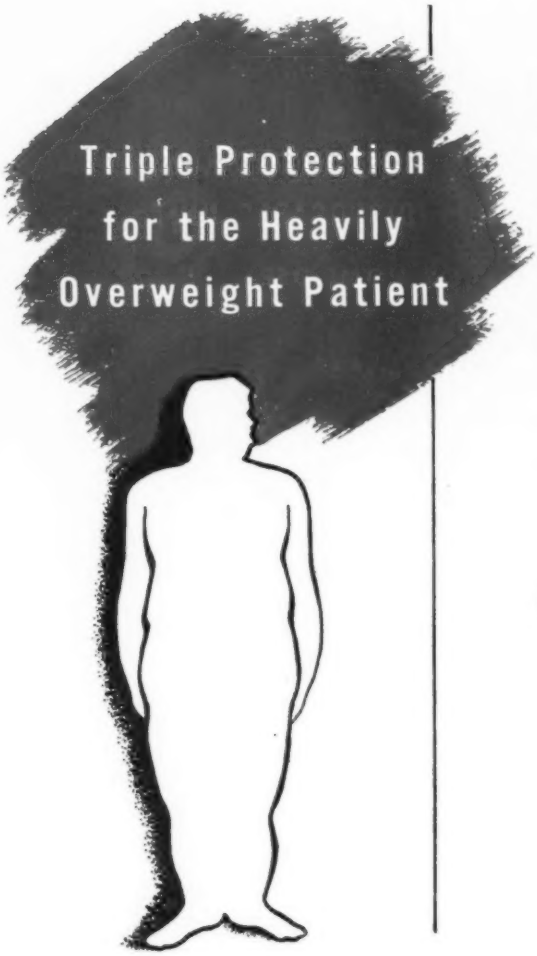

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1. Zelman, S.: Arch. Int. Med. 90: 141, 1952.

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(1) Sweatman, C. A., J. So. Carolina M. A., 49:38, 1953. (2) Marks, M. M., Am. J. Dig. Dis. 18:219, 1951. (3) Hamilton, H., in Trans. 5th Am. Cong. Obst. & Gyn., Mosby, 1952, p. 69. (4) Burnikel, R. H., & Sprecher, H. C., Am. J. Dig. Dis. 19:191, 1952. (5) Marks, M. M., Personal Communications, 1952-53.

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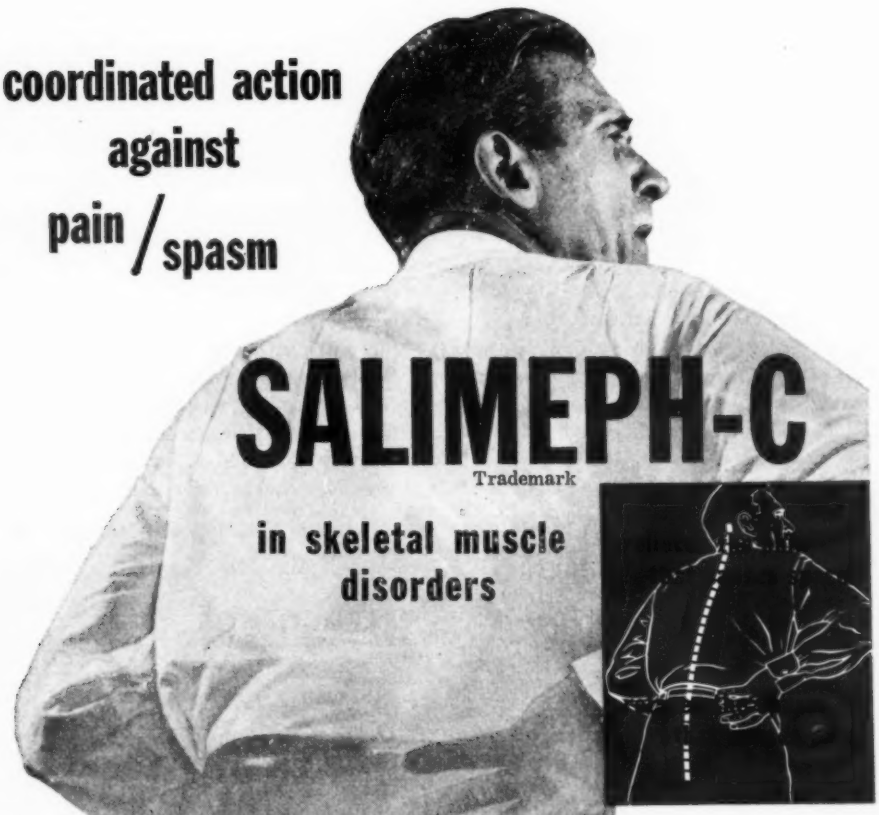

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REFERENCES: 1. Natenshon, A. L., Wisconsin M. J., in press. 2. Seeberg, V. P., et al.: J. Pharmacol. & Exper. Therap. 101:275, 1951. 3. Brodie, D. C., and Szekely, I. J.: J. Am. Pharm. A., Scient. Ed. 40:414, 1951. 4. Wegmann, T.: Schweiz. med. Wchnschr. 80:62, 1950.

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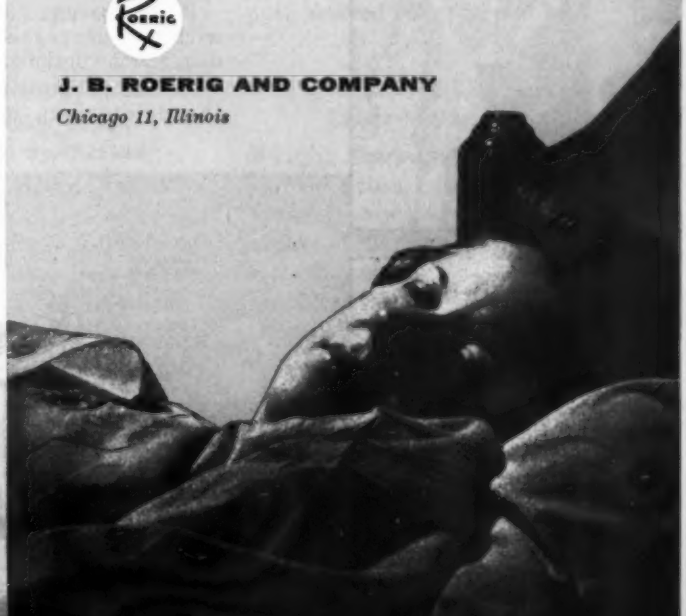

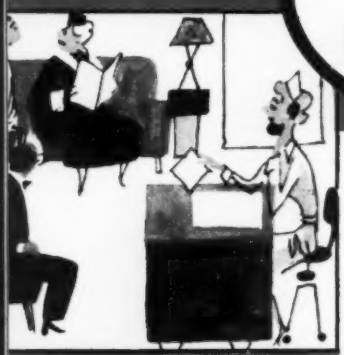

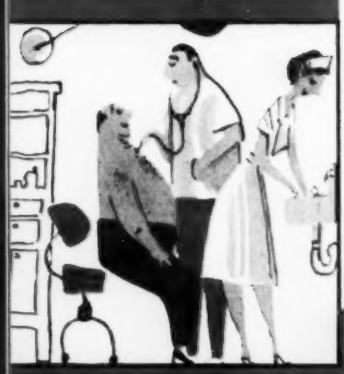

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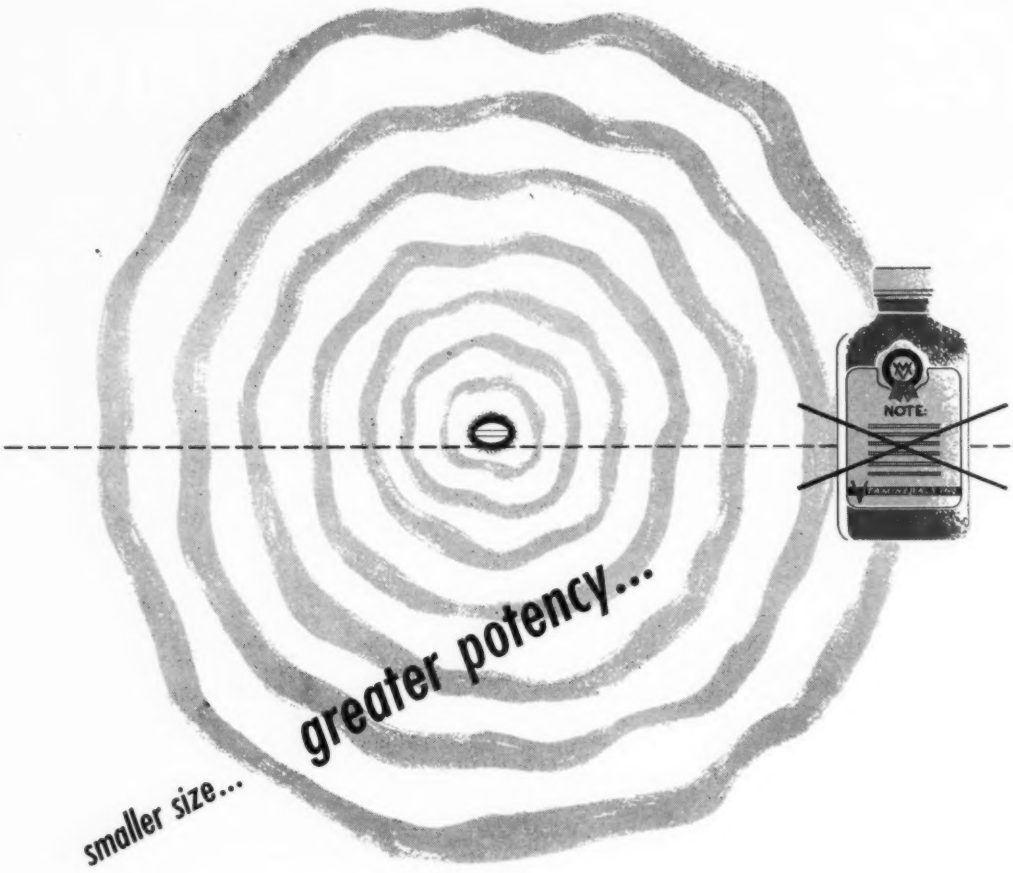

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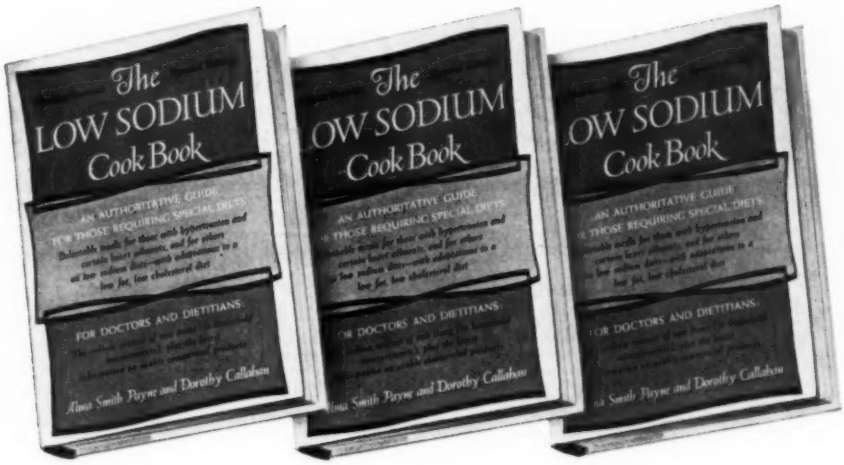

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*By Alma Smith Payne and Dorothy Callahan, research dietitian, Massachusetts General Hospital, with introduction by Francis L. Chamberlain, M. D., M. Sc. D.

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Surgical Number*

Body Mechanics and the Surgeon
Pseudosurgical Pain Syndromes

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The practice of surgery today envisions not only the development of certain technical skills but, in addition, the creation of a clinician who, by virtue of training, education, and experience, develops knowledge, judgment, and wisdom which he utilizes in diagnosis.

As a rule the general surgeon is the one who assumes the role of the last court of appeal to render a decision whether a certain patient shall be subjected to surgery in an attempt to relieve a complaint; upon this decision rest the life and welfare of the patient.

Such a responsibility demands that the surgeon be a complete master in diagnosing from surgical signs and symptoms and further implies that he is familiar with those signs and symptoms which simulate surgical disease, but where the use of the scalpel is not necessarily indicated. The basic objective of this paper is a clarification of the latter.

Acute surgical pathologic conditions present a dramatic clinical picture, and although differential diagnosis may sometimes be difficult, the very nature, intensity, and character of the symptoms and condition of the patient merit surgical investigation. On the other hand, some of the subacute symptoms and many of the chronic complaints, particularly those with negative laboratory findings, remain a challenge to the diagnostic acumen of the surgeon. Many is the time an unwary technician has performed a surgical procedure only to be embarrassed by the complete absence of pathology, or subsequent to surgery he has been confronted by the patient registering the same complaint as before.

A typical example is the diagnosis of chronic appendicitis without a specific history of a preceding acute attack. Careful surveys of this condition reveal that appendectomies performed on such a diagnosis end with 10 to 70 per cent (an average of 40 per cent) unsatisfactory response. Similar but less dramatic statistics are available for adhesionectomy, chronic cholecystitis, retroverted uterus, and the like.

Most surgery is performed for relief of some ache or pain. If a specialist's mind and thought processes are restricted to those structures and viscera usually productive of the symptoms or within his scope of surgical practice, he is prone to attribute to those structures or viscera the stigma of etiology whereas, in justice to the patient, he should expand his intellectual horizons to encompass and consider every possible etiologic source of the complaint before he reaches a decision to perform surgery.

My first stimulus to further study of the reflex aches and pains produced by derangements of the musculoskeletal system which simulate the symptoms of visceral disease arose early in the development of orthopedic specialization. When examining and treating patients with back and postural problems I noted that incidental complaints within the history revealed that many were bothered with chronic dyspepsia, or stomach ulcers, chronic colitis, or chronic gallbladder disturbance, and, when discharged as rehabilitated from their orthopedic problems, many mentioned that these incidental complaints had likewise disappeared. The impact upon an orthopedist with a previous general surgical background was great, and this paper is an attempt to explain and document some of these pain syndromes and unsatisfactory results of surgery.

Although much of this paper is based on personal hypotheses, I shall refer to the literature to justify some of my statements. Morley[1] states that pain arising from any deep structure whether it be a viscus or a deep somatic structure supplied by the same segment of the cord, will have the same segmental distribution and may be accompanied by the same reflex signs; and Lewis[2] puts it this way: ". . . the strictly objective comparison of reflexes arising out of stimulation of spinal muscles, on the one hand, and of a viscus, on

*The articles included in this Surgical Number were presented at the Twenty-Sixth Annual Clinical Assembly of the American College of Osteopathic Surgeons, Los Angeles, October 18-22, 1953. See editorial pages for additional information.

the other, shows that the responses are indistinguishable in all essentials."

These two quotations clearly reveal that diseases or deformities or involvements of the musculoskeletal system can and do produce signs and symptoms simulating or even substantially identical with those produced by visceral disease. The surgeon is therefore required to take these factors into consideration, and as part of an examination the musculoskeletal structures should be investigated before any surgery is performed if the diagnosis is doubtful.

There are so many types of pain and so many connotations arising from the word that the devotion of adequate time to history taking is a diagnostic essential. How, where, when, and under what circumstances the patient is bothered must be understood. In addition, the physician must have a clear understanding of the implications and import of the various types of pain.

I will not attempt to describe or classify the usual acute pains so familiar to the surgeon, since all surgeons are aware that colicky pain is characteristic of involvement of a hollow viscus and that severe burning pain, an immobile abdomen, and an immobile patient are consistent with peritonitis. Rather I will attempt to delve into the less clearly defined types, describe, analyze, and finally exemplify them in surgical practice. With this objective in mind and for purposes of this paper, four types of pain will be studied: (1) neuritis and neuralgia, (2) radiculitis, (3) referred or reflex pain, and (4) causalgia.

Rather than be bound by the exact scientific definition of these pains, an applied or clinical definition will be used. If the patient's symptoms can be established in the proper classification an advancement will have been made, if not toward a specific diagnosis, at lease toward a correct evaluation.

NEURITIS AND NEURALGIA

Though these two conditions are somewhat different pathologically, they will be considered together for purposes of this paper. *Neuritis* is an inflammation of the nerve structure which produces pain and tenderness along the course and distribution of the nerve. It is associated with cutaneous paresthesia and in the more severe cases with perversion of motor and reflex function of the structures supplied by the nerves.

Neuralgia is a sensation of pain along the course or at specific areas of distribution or termination of the nerve without primary involvement of the nerve itself. Neuralgia is characterized by pain and cutaneous tenderness rather than nerve tenderness. The former is usually so characteristic that gross errors of diagnosis are infrequent; however, neuralgia, particularly of the segmental character, is prone to present its most acute manifestation at certain trigger or terminal areas. The patient's description may lead the physician to the conclusion that the pain is primarily localized. Involvements of the ninth thoracic through the first lumbar nerves may project themselves primarily to the abdominal wall, and unless the examiner makes a careful study of the entire neuralgic segment, he may interpret the abdominal wall tenderness as arising from visceral disease.

Judovich and Bates'[3] statement should be remembered by the general surgeon. "In the chronic stage of pain and tenderness, bad body mechanics, lordosis and scoliosis and trauma are the chief causes. . . . Repeated observations suggest that the combination of segmental pain and tenderness has its origin in or close to the vertebral column, rather than in the periphery or by referred visceral stimuli. . . . Patients with chronic pain and tenderness of segments involving the abdominal wall, who obtain no relief from surgery, often improve or are cured of their complaints when therapy is directed to the spine."

RADICULITIS

Radiculitis is an irritation, inflammation, or compression involving a specific nerve root with symptomatology essentially that of neuritis or neuralgia. When the involvement is of the roots of the thoracic spine terminating in the anterior abdominal wall, the differentiation may be difficult. This type is included, however, primarily because of the lumbar components whose areas of referral are to the buttocks, thighs, and legs. The more severe and dramatic radiculitis, such as occurs with herniated intervertebral disk, is rarely confusing. The more vague symptoms or incomplete dermatomes, however, are frequently attributed erroneously to a gynecologic or proctologic origin.

The pains of radiculitis always follow a specific pattern. In the milder cases this pattern may vary in length but never in position. There is frequently an associated sensation of numbness with or without altered sensory perception of the involved cutaneous areas. This symptom complex is never the product of visceral disease.

REFERRED OR REFLEX PAIN

Referred or reflex pain may be likened to the great magician who creates illusions baffling to his audience, yet, like a magic illusion, once the mechanism is revealed it may be readily understood. It may be simply described as pain produced by irritation to a structure of low sensibility and transmitted through the same neurologic segment to a distant area of higher sensibility.

Surgical texts are replete with examples of referred pain from visceral zones, classic examples being the early epigastric pain of acute appendicitis, shoulder blade pain referred from the diaphragmatic area, and pain in the left upper extremity referred from the heart. Associated muscle spasms or splinting is a phenomenon familiar to all surgeons.

Less impressed upon the surgeon's consciousness, and frequently forgotten because of minimal, if any, inclusion in the surgical literature, is the fact that irritation or stimulation of the somatic (or musculoskeletal) structures may produce in almost exact detail the same symptoms. Kellgren's[4,5] classic experiments are most demonstrative. By injecting hypertonic saline solution into the interspinous ligament of the ninth thoracic vertebra he produced pain in the right upper abdomen associated with deep tenderness, rigidity of the upper rectus muscle, and even phantom tumor. Injecting the first lumbar interspinous ligament produced signs resembling renal colic with the typical distribution of pain, retraction of the testicle, palpable rigidity, and deep tenderness of the lower part of the abdominal wall.

To fully appreciate the above facts, it is important to realize that pain fibers supplying both the somatic and visceral areas are physiologically and anatomically identical, the former following the channel of the spinal nerves, and the latter sometimes the route of the sympathetics. However, both blend together at the posterior spinal roots, and therefore there is a general afferent supply common to deep-lying somatic and

certain visceral structures. The pain impulses of either initiate a series of motor and sensory responses almost identical in character.

Further, it must be remembered that visceral structures themselves are not sensitive to the usual painful stimuli but only to tension arising from distention or obstruction. Within the abdomen the more characteristic pain sensations arise from stimulation or irritation of the peritoneum, including the mesentery. Consequently, an inflammation or disease confined within the viscera itself, without tension or obstruction, produces little if any true pain. This is the reason malignancy of the bowel so frequently remains asymptomatic until it invades the peritoneum or produces obstructive signs. By the same token, a ureteral calculus while being passed produces severe colic, but once passed, even though hematuria continues, indicating laceration, little if any real pain persists. These viscera have no direct cutaneous components, and chronic sensitivity of the abdominal parietes must not necessarily be considered the result of intrinsic visceral disease.

On the other hand, irritation or inflammation of the peritoneum, including the mesentery, produces referred or reflex pain with skin hyperesthesia and reflex muscle spasm. To this phenomenon Morley's[1] designation of peritoneocutaneous and periteneomuscular reflex action may justifiably be applied. The usual essential difference between a peritoneocutaneous hyperalgesia of the skin and a segmental neuralgia of the same location is that in the former the hyperalgesia remains relatively localized to the area of the abdominal wall overlying the inflamed section of the peritoneum, whereas in segmental neuralgia there may be an area of acute abdominal wall tenderness. However, if a careful examination is made, a segmental component will be found following the course of the nerve distribution to and including the spinal area, with a trigger zone over and adjacent to the spinous process of the involved segment.

Peritoneomuscular reflexes explain why splinting in acute appendicitis is a late instead of an early manifestation, and, similarly, why there may be little true splinting with acute obstructive cholecystitis, although it is present with empyema of the gallbladder.

CAUSALGIA

Causalgia is described as a burning pain associated with more or less cutaneous color changes varying from a purplish tint to a reddish hue, with the skin becoming smooth to glossy and often wet with sweat. For many years this has generally been considered the end result of incomplete section of the brachial plexus or median nerve of the upper extremity, or the sciatic, medial popliteal, or posterior tibial in the lower extremity. Many theories as to its mechanism have been propounded, indicating that none are totally impregnable to analysis. These theories run the gamut from a local artificial synapse between the sympathetic and sensory fibers, causing a short circuit mechanism wherein impulses may travel both centrally and distally (antidromic), thus producing a peripheral or central disturbance; or a disturbance of the central nervous system within the cord with disruption of central control. Preganglionic sympathectomy usually relieves the symptoms.

Discussing this type of pain in a paper stressing pseudosurgical syndromes may be questioned, but I believe that the literature is incomplete in its understanding and discussion of this subject and that a causalgic state or syndrome need not necessarily be restricted to the classic locus. It would appear inconceivable that a syndrome affecting nerve reflexes must be confined to only a few structures. Rather, a similar phenomenon with slightly different clinical manifestations may exist in the body wherever a similar central and sympathetic nervous system association is present.

Impressive indeed are such conditions as Sudeck's atrophy of a hand or foot following a minor sprain, the clinical picture of which is manifestly causalgic. The essential characteristic of causalgia is the burning character of the pain, the skin manifestations being secondary, sometimes gross and sometimes barely perceptible. If minor trauma to an extremity can produce such dramatic symptoms locally, there may be justification in feeling that stimulation or irritation to one or more of the vertebral joints or somatic structures could produce the same reflex phenomena and, when the segmental anatomy is related to the abdomen, could produce deep burning pain interpreted by the patient as arising within the abdomen, thereby creating a clinical picture misleading to the surgeon.

The following history is not unusual in general surgical practice. A middle-aged man or woman complains of chronic symptoms characterized by a burning pain in either the epigastrium or right upper quadrant of the abdomen with an associated area of distress near the inferior angle of the scapula, constant in character most of the time, but with transitory periods of exacerbation and remission. The patient may have negative x-ray and laboratory findings and an indifferent response to treatment directed to the gastrointestinal tract. Eventually exploratory laparotomy is performed with negative findings or a suspicious gallbladder is removed, but the patient continues with the same complaint. A similar patient, refusing exploratory surgery, some few years later may eventually produce x-rays positive for gastric ulcer.

One might be justified in considering that the first patient is afflicted primarily with a causalgic state arising as a result of irritation from the somatic structures and that, in the second patient, the gastric ulcer is the end result, rather than the cause, because as Livingston[6] so aptly claims, "A chronic irritation of sensory nerves may initiate clinical states that are characterized by pain and a spreading disturbance of function in both somatic and visceral structures. If such disturbances are permitted to continue, profound and perhaps unalterable organic changes may result in the affected part."

CLINICAL APPLICATION

By utilizing the preceding information as a foundation and fortified with adequate knowledge, an approach can be made to a clinical diagnostic problem. It requires, however, that this knowledge be applied correctly. Considerable effort needs to be expended in taking a history, and completeness of the physical examination is imperative.

The patient who is doubled up by severe colic or the patient with severe abdominal pain associated with a rigid and immobile abdomen is not within the province of this paper because the diagnostic implications are clear. To be considered, however, are those patients who complain of subacute or chronic symptoms. Although their pain is less dramatic, its character is just as indicative.

The location of the pain might be the first consideration not because, as the uninitiated might believe,

it localizes the area of pathology but, contrariwise, because in many instances the reverse is true.

Generally speaking, pain produced by an involved visceral structure is projected to its area of embryonic origin rather than to its anatomic position. Thus symptoms in the alimentary canal and its glands refer pain to the midline anteriorly or bilaterally around the midline, irrespective of the intra-abdominal location of the viscus, as a result of the bilateral innervation. Pain from the stomach, duodenum, and ileum is referred above the umbilicus; that from the appendix is referred at the umbilicus, and that from the colon below the umbilicus, and except for these broad areas of reference there is no specific area of distribution for individual organs. If, however, the peritoneum becomes involved, localized pain may, and usually does, develop. By the same token, laterally developed viscera such as those of the genitourinary system refer their pain symptoms to the lateral areas of the torso.

Pain of somatic origin is felt in the area of the skin supplied by the cerebrospinal nerve or nerves. This somatic area of reference becomes misleading if the terminal area of distribution overlays a viscus, because the tenderness of the abdominal parietes on palpation may be erroneously interpreted by the examiner as arising from a tender viscus beneath. Such diagnostic aids as the Murphy gallbladder sign and Murphy kidney punch test may be just as positive when directed to an area of somatic reference as in the usually accepted usage. Any other similar pressure or percussion signs may likewise indicate either visceral or somatic involvement.

Generally speaking, the more specifically localized the pain, the more superficial the origin, and the more general or less clearly defined the pain, the deeper the origin. Associated nausea and vomiting are rarely symptoms of pain produced from a superficial source and are more likely to be of deep visceral than deep somatic origin.

It becomes increasingly obvious that a routine procedure of simply pressing, poking, or digging at or through the abdominal wall does not constitute adequate study of the area. It is necessary to examine the abdominal wall as a separate entity. The fascia and muscles must be so palpated as not to transmit stimulation to the underlying structures. Skin sensitivity or paresthesia must be traced accurately and, when specific patterns are noted, must be accurately evaluated. The patient's spinal and paraspinal area should be studied, and if a sensitive or trigger zone is located, this area should be irritated. If such irritation or stimulation aggravates or reproduces the original complaint, a somatic rather than a visceral source of the complaint should be given serious consideration.

If after adequate examination doubt still exists, ½ to 1 per cent procaine infiltrated into a sensitive area of the abdominal wall will tend to eliminate the symptoms produced by local abdominal wall involvement but will not influence the pain produced by a tender viscus. Similarly, an etiologic source in the paraspinal area, when infiltrated with procaine, will eliminate the referred symptoms anteriorly, but will not eliminate the symptoms produced by involvement of the intra-abdominal structures.

Causalgic pain is of a burning character; there may or may not be cutaneous or deep manifestations or sensitivity. This condition is associated with a strong sympathetic and vasomotor component. The symptoms are unaltered by superficial or trigger point injections but are substantially improved or completely relieved by paraspinal sympathetic blockade. Paraspinal sympathetic block has little effect on the pain produced by intrinsic visceral disease or pain produced by irritation to the cerebrospinal nerves.

I have utilized procaine blockade in one form or another in so many cases with resultant diagnosis and cure of patients previously operated on without relief, that I feel its value as a diagnostic and therapeutic agent cannot be too strongly stressed.

Following the examination directed to the area of the complaint, and as part of the general physical examination, the surgeon should not fail to study the general body mechanics and posture. A short leg with a tilted pelvis and associated scoliosis may lead to finding that the apex of a curve is at the segmental level, the distribution of which would exactly correspond with the location of the patient's symptoms. As simple a procedure as placing a lift under the heel of a short leg has cured many cases of previously diagnosed chronic appendicitis, chronic gallbladder trouble, and even coronary disease.

Poor posture, however, has a much more intangible but significant influence. A dropped front panel of the abdomen is consistent with visceroptosis. Such a condition to a marked degree is consistent with venous congestion, as a result of the loss of the normal diaphragmatic function and the differential of the intra-abdominal and intrathoracic pressure mechanism, which is important in the production of venous return.

All surgeons are aware that rough handling of the viscera during surgery, particularly strong traction upon the mesentery, is likely to produce shock. It may be hypothesized that the constant tugging on the mesentery because of visceroptosis may produce low grade stimuli to the sympathetics and, accumulating over an adequate period, may produce dysfunction with symptoms and eventually even lead to organic changes. It has been adequately demonstrated by barium x-ray that normalized posture may elevate the stomach as much as 6 inches and the colon 3 inches, yet I rarely examine a patient in orthopedic practice who has been placed on postural exercises and control by his general surgeon.

It should be remembered that nerves of visceral sensation run their course along mesenteries, across ganglia, through the diaphragm, and beside the thoracic vertebrae, and that, anywhere along the course, stimulation is registered in the brain at the point of origin rather than at the area of excitation. The gastric crisis of tabes is a reminder that severe intra-abdominal symptoms may be extra-abdominal in origin.

Although it is not feasible to discuss the application of all the ramifications of the symptoms of somatic origin, a few brief remarks relative to back pain appear indicated. In 1951 my associate, Dr. Arthur Miller, made a rough statistical study of our female patients whose complaint was low-back pain, with or without radiating symptoms into the lower extremities. This revealed that almost 50 per cent had undergone some type of gynecologic, proctologic, or other general surgical procedure which was supposed to effect a cure. The dearth and type of sensory nerves supplying the viscera should indicate that few, if any, severe back symptoms arise from visceral disease. Any complaint other than of a dull, annoying backache must be considered first as somatic in origin.

The probability is that cervical cauterization will cure more gynecologic back complaints than will uterine suspension, and lumbar manipulation and attention to body mechanics will cure more than the others combined.

Although not specifically germane to the topic in this enlightened era of psychosomatic medicine, I should like to conclude with the warning that some abdominal complaints may arise, not so much as the result of organic disease of the viscera, as from functional disturbance of the brain.

SUMMARY

The objective of this paper is to explain and document some of the pain syndromes of somatic origin simulating visceral surgical disease. Some personal hypotheses have been advanced, and experimental findings of outstanding medical research investigators have been cited in substantiation.

It is hoped that this paper will help to impress the general surgeon with the fact that diseases and deformities of the musculoskeletal system may and do produce symptoms simulating visceral disease, and that adequate examination of the somatic structures may at times reward the surgeon with an accurate diagnosis or prevent an unnecessary laparotomy.

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Diverticula of the Gastrointestinal Tract

CHARLES L. BALLINGER, A.B., D.O., F.A.C.O.S.
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The incidence of diverticulum of the gastrointestinal tract varies from rare to rather common depending upon the region of the alimentary system in which it is located and the pathologist, anatomist, roentgenologist, or clinic reporting. Likewise, the management of the patient with diverticular disease varies with the location and the type of involvement, from "masterful inactivity," to meticulous medical management, to delicate and sometimes radical surgery. It should also be noted that diverticula cannot be prevented, nor can they be made to disappear except by surgical procedures.

ESOPHAGEAL DIVERTICULA

Gastrointestinal diverticula are of three types—pulsion, traction, or a combination of the two, the traction-pulsion type.

All three types occur in the esophagus. The pulsion type most commonly encountered here is actually not a true diverticulum and not esophageal in origin. It is a herniation of the mucosa and submucosa of the hypopharynx between the circular and oblique fibers of the constrictor muscles. It is assumed that there must be a defective posterior hypopharynx or a failure of relaxation of what Jackson[1] speaks of as the "cricopharyngeal pinchcock" as the bolus passes within the lumen. According to Shallow,[2] the herniation thus produced can occur above the cricopharyngeus muscle, below the cricopharyngeus and above the circular muscles of the esophagus, and through the lower part of the inferior constrictor muscle. As the sac develops and its size increases it changes from spherical to pear-shaped and passes posteriorly and to the left.

Before a sac is actually demonstrable, the patient notes only throat irritation similar to that caused by lodgment of a dry cracker crumb in the area. Progress is slow and insidious; dysphagia develops and finally almost complete obstruction occurs. The duration of these progressive complaints may be from a few months to as long as 20 years. Excessive mucus, a noise when liquids are swallowed, cough, regurgitation of food and mucus, a gurgling sound as the head is turned or its position changed, and a fetid breath are the more common complaints. Swelling in the neck is infrequent and pain uncommon.

X-ray is essential in determining the exact location of the sac, its size, and the amount of retention. Some diverticula become large enough actually to enter the mediastinum. Endoscopy can be invaluable in locating the aperture and establishing a differential diagnosis.

Some palliation may be had by "thoroughly masticating bland foods and following with a full glass of water after meals to wash out the sac."[3] Jackson and Jackson[4] have afforded relief by dilating the orifice of some sacs.

Operation offers the only curative treatment. Papers dealing with this subject have often produced much controversy as to whether these pharyngoesophageal pulsion diverticula should be removed in one or two stages, excised or inverted. In Philadelphia, entirely because of the influence and corroboration of Jackson and his associates, the one-stage operation is routine. Bockus[5] states that this method is the one of choice if an experienced esophagoscopist is available. Lahey,[5] on the other hand, vehemently and enthusiastically defended the two-stage procedure, basing his decision on fatality percentages, morbidity percentages, and recurrence rates. There were only two fatalities in 321 cases reported by the Lahey Clinic. There was practically no morbidity and only nine recurrences. These occurred in the early years of experience with this operation. The Cleveland Clinic[6] has reported treating eleven cases by inversion. Results were excellent but today, as Graham[7] points out, hernias are not treated by inversion of the sac. Careful surgery and antibiotics have greatly reduced the risks which at one time attended such formidable operations. Each surgeon must make his own decision as to what procedure he will use, but in a search of the literature I can find no report of a large series of cases attended by the superlative results of the Lahey Clinic.

Traction diverticula are due to pulling from without, usually by the healing of inflamed lymph glands adherent to the esophagus. Tuberculosis of the tracheobronchial glands is most frequently the cause, although disease of a vertebra has sometimes been the etiologic factor. These are true diverticula, since all coats are present in the sacculation. They are usually located in the midesophagus, the pouch developing on the anterior or anterolateral wall opposite the bifurcation of the trachea. The sac points upward and forward. The apex is usually higher than the large aperture and, possessing all its muscular coats, it fills and empties readily and consequently seldom produces symptoms and rarely requires treatment. Likewise, ulceration and perforation are very rare but such phenomena must be remembered as the possible cause of mediastinal abscess or esophagobronchial fistula.

Supradiaphragmatic pulsion diverticula of the esophagus are rare. They are false diverticula, from the standpoint of being a protrusion of only the mucosa and submucosa. They produce symptoms caused by accumulation in the sac of food which becomes decayed, resulting in a foul odor, bad taste, nausea, and local pain. Mechanical obstruction eventually occurs in most cases owing to cicatrization and narrowing of the lumen about the neck of the diverticulum. Although dilatation may be required as in the traction type, it alone is not sufficient treatment. If obstruction is not a serious consideration, operation, approaching the lesion transthoracically, consists of either suspending the sac or complete excision of the diverticulum. When narrowing of the esophagus is a serious consideration, transthoracic resection of the lower end of the esophagus is performed and the stomach is brought up into the thoracic cavity and anastomosed there to compensate for the loss of the resected portion of the esophagus. A note of warning is inserted here. Although the antibiotics have been a boon that has made thoracic surgery almost commonplace, they seem to have little influence upon the mediastinitis which frequently follows efforts to dilate obstructive lesions of the esophagus even when actual perforation does not occur.

GASTRIC DIVERTICULA

Gastric diverticula are exceedingly rare; Rivers, Stevens, and Kirklin[8] of the Mayo Clinic report only ten removed in 11,234 exploratory operations on the stomach. These lesions are most frequently located in the upper portion of the lesser curvature just below the esophageal orifice. No symptoms are present when the diverticulum is uncomplicated by inflammation, malignant disease, or hemorrhage. Likewise, operation is not indicated unless the differential diagnosis is not clear and there is the possibility that the lesion may be a large ulcer, carcinoma, diverticulitis, or hemorrhage, or it does not respond to medical treatment, or the pedicle is narrow and the sac large and wide.

DIVERTICULA OF SMALL INTESTINE

Duodenal diverticula are encountered frequently in the course of gastrointestinal roentgenology and autopsy, varying in incidence according to different authorities from 5 per cent to 20 per cent in persons over 50 years of age. Most are asymptomatic, and the number requiring removal is very small. Retention of barium in a duodenal diverticulum is not in itself indication for operation. However, in diverticulitis with perforation, massive hemorrhage, retention of foreign bodies, malignant degeneration, or obstruction of the common bile or pancreatic ducts, or when the patient has severe upper abdominal symptoms for which no other cause can be established, operation is indicated.

Mention should here be made of a group of "false" or so-called secondary diverticula of the duodenum and stomach which are caused by adherence of the wall of the viscus to some adjacent area by scar tissue. They frequently follow conditions such as duodenal ulcer and repeated attacks of cholecystitis. These lesions are not infrequently encountered in gastric and gallbladder surgery. Treatment is that of the causative disease.[9]

Operative procedures for duodenal diverticula usually pose serious technical problems owing to difficulties in exposure and identification, the frequent origin of the sac from the vicinity of the ampulla of Vater, and acute inflammation which is often present. Meticulous dissection is always required and numerous maneuvers are described to facilitate identification, exposure, and dissection and to avoid damage to important organs, ducts, or vessels in the neighborhood. Extraordinary care must be exercised to provide safe closure of the base and still not produce obstruction. It has been reported that in about 10 per cent of operations the major papilla is carried into the diverticulum and opens into it. Also, almost all diverticula of the second part of the duodenum project into the pancreas.

Excluding the rather common anomaly of the omphalomesenteric duct known as Meckel's diverticulum, diverticula of the remainder of the small intestine are not common, their formation seeming to decrease proportionately from the second portion of the duodenum to the terminal ileum. The mere evagination of the intestine is rarely of clinical significance. Medical treatment affords little relief so, if symptoms are present, resection of the involved area of small bowel, which presents no great problem to the expert abdominal surgeon, is done. In passing, note is made of three cases of duodenal and jejunal diverticula which penetrated the diaphragm, thus becoming thoracic, and produced cardiorespiratory disturbances, chest pain, and serious alimentary tract hemorrhage because of ulceration. All were operated on successfully.

Meckel's diverticulum has been encountered by every abdominal surgeon in routine exploration of the abdominal contents. It is located most frequently about 100 cm. proximal to the ileocecal junction of the antimesenteric border of the ileum. It is typically lined with mucosa of the ileum, although 15 to 20 per cent are reported to contain islands of gastric mucosa and not uncommonly a small nodule of pancreatic tissue, especially in the tip. Peptic ulcer located near the orifice of a Meckel's diverticulum and causing intestinal bleeding and perforation has been reported. In these cases the entire diverticulum has been lined with gastric mucosa, thus furnishing additional proof of the importance of gastric juice in the genesis of ulcers. Tumors may also arise within the tissues of Meckel's diverticulum. It is for these reasons that the anomalous structure is routinely removed whenever found.

DIVERTICULA OF LARGE INTESTINE

The *appendix* and *cecum* are very rarely the site of diverticula. Large solitary sacs have been reported arising from the cecum. The symptoms are those of appendicitis, and diagnosis usually made at the operating table. The treatment is also determined there and depends upon the prevailing condition.

Diverticula of the colon are most common in the sigmoid portion and decrease in incidence toward the

cecum and rectum. They are usually situated between the mesocolic and antimesenteric taeniae. They are frequently arranged in rows and are often confined to the appendices epiploicae. Many may be found close to the mesenteric attachment. From the outside they appear as spherical blue-black masses but are often so completely and densely covered by fat that their identification is difficult. Once established, and in the absence of inflammation, the only change in a colonic diverticulum is an increase in size; however, many roentgenologists report that there is often an increase in number as the patient grows older.

Diverticulosis, a term given to the presence of uncomplicated, noninflammatory diverticula of the colon, is not a cause of symptoms and in itself does not require treatment. Symptoms when present are usually attributable to an irritable colon. However, if the mucosa is penetrated, a reaction similar to appendicitis occurs. Occlusion of the orifice by feces or edema is the forerunner of this phenomenon. Inflammation may be acute or chronic and may spread in the surrounding tissue as peridiverticulitis. Perforation is usually limited with abscess formation. Occasionally perforation is into the free peritoneal cavity with resultant peritonitis. Rarely, fistula to the genital tract is established. Higgins[10] reports that 160 of 328 cases of vesicocolic fistulas which he studied resulted from inflammatory changes.

The incidence of diverticulosis has been reported by many. At the Mayo Clinic in 1939 Buie[11] noted that at necropsy 5 per cent of all people over 40 years of age had diverticulosis and estimated that 6 per cent of all persons over 40 will develop evidence of the condition. Diverticulitis occurs frequently in diverticulosis, and a considerable number of patients develop complications requiring surgery.[3]

Theoretically, uncomplicated diverticula of the colon should not give rise to any symptoms. Moreover, it is the opinion of many that when symptoms do appear which might be referable to this condition, inflammation has occurred. The most common symptoms and complaints are constipation, diarrhea, flatulence, and pain. However, objective and subjective signs may include all those that arise in gastrointestinal disease, from those of an ulcer syndrome to nausea, headache, melena, and so forth.

Diagnosis of diverticulosis or diverticulitis of the colon should always be confirmed by x-ray. Sigmoidoscopy should also always be done even though the presence of diverticulitis is rarely found by this examination. Its value is in ruling out a malignant lesion of the sigmoid or rectosigmoid. The possibility of error is great in the differential diagnosis of diverticulitis and carcinoma. The following points may aid: (1) A long history of chronic constipation with recurrent bouts of pain is more likely in diverticulitis. (2) The presence of fever, leukocytosis, and localized pain favors diverticulitis. (3) There is usually little weight loss and the general condition of the patient is good in diverticular disease. (4) Carcinoma is most frequently situated in the rectosigmoid where it may be seen through the rectosigmoidoscope and a specimen can be obtained for biopsy. In addition, the skilled and experienced sigmoidoscopist will recognize certain signs of differentiation. (5) X-ray study will usually clarify the diagnosis. However, it must not be forgotten that early carcinoma may be superimposed on an old diverticulitis. (6) Patients with diverticulitis rarely pass gross blood per rectum but those with colonic carcinoma frequently do. If some doubt remains after all these examinations, exploratory laparotomy is justified.[5]

Diagnosis and treatment of colonic diverticulitis are largely a medical gastrointestinal problem. However, if the process fails to respond to medical and dietary management, if obstruction occurs and persists, if perforation or fistula complicates the case, and if the absence of carcinoma cannot be ascertained, surgical intervention will be required. Sagacity and keen judgment by the surgical consultant will be required in most instances in determining when to operate, and often the method of choice will be decided only at the operating table.

There are three surgical procedures available:[5] (1) primary resection with end-to-end anastomosis, which is reserved for those few cases when the disease is quiescent, the patient adequately prepared, and healthy bowel available for the anastomosis, (2) the Mikulicz extraperitoneal type of resection for cases in which there is recent inflammation prohibiting primary anastomosis but in which it is technically possible to exteriorize the involved segment of bowel, and (3) the most popular and safest, the three-stage procedure consisting of diversional colostomy followed by resection in 3 to 6 months, and shortly thereafter closure of the colostomy. It must be strongly emphasized that resection by any procedure must not be performed except when all conditions are optimal unless one wishes to invite leakage and fistula formation.

Perforation of one or more diverticula of the colon may also require expert surgical judgment. The perforation should be closed if this can be accomplished without disturbing the body's localizing mechanism. Often only adequate drainage can be instituted. Usually, efforts are made to close the perforation and establish drainage, and a diversional colostomy is performed. The diseased section may then be prepared for later resection.

Vesicosigmoidal fistula rarely occurs in women because of the barrier which the uterus presents between the bladder and the sigmoid colon.[5] When this complication arises it is treated by staged procedures consisting of diversional transverse colostomy, resection of the fistula and diseased bowel, and finally closure of the colostomy. Again, 3 to 6 months must elapse between the first and second stages.

SUMMARY

Diverticula of the gastrointestinal tract may occur anywhere from the esophagus to the rectum. It has been pointed out that those in many regions are asymptomatic and are found only upon x-ray examination of the gastrointestinal tract or at autopsy. The possibility of such lesions should be considered, however, as a cause of vague and otherwise unexplained symptoms referable to the alimentary system. When treatment is required it is usually medical except for diverticula of esophageal origin. It has been emphasized that when operation is indicated, in most instances multiple-stage procedures are the methods of choice if complications and untoward sequelae are to be avoided.

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Peripheral Vascular Episodes

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Though there is a paucity of knowledge concerning etiology and pathogenesis of several peripheral vascular disorders, certain therapeutic measures directed toward their management are available. Some of these measures are now considered spectacular but no doubt will seem commonplace in the future.

A summary of surgical and closely allied specialized treatments used to cope with the most frequent of peripheral vascular episodes is in order. These unfortunate occurrences will be discussed in sequence, not in relation to their frequency or lethal nature, but according to whether they occur in the venous or arterial systems.

In certain locales and teaching hospitals peripheral vascular disease as a subject is a subdivision of general medicine. These institutions depend greatly upon anticoagulation therapy in managing thromboembolic incidents. In other parts of the country, as in ours, the subject is presented as a subdivision of general surgery. More radical treatment is preferred, since it has been noted that once a vessel has been thrombosed and recanalized, even with the help of anticoagulants, it is more susceptible to thrombosis. Hence, surgical intervention might just as well be undertaken in the first instance, if there are no contraindications, and it is the treatment of choice. This can be considered being conservative in the long run by being radical pro tem.

SUPERFICIAL VENOUS THROMBOSIS

Superficial venous thrombosis (spontaneous) as it occurs in varices of the saphenous system is treated by immediate ligation and segmental resection of the vein involved, at its junction with the deep venous system, usually at the saphenofemoral or saphenopopliteal union. This obviates pulmonary infarction. The thrombus left in situ presents no hazard.

DEEP VENOUS THROMBOSIS

The deep venous thromboses considered in this paper include thrombophlebitis, phlebothrombosis, and suppurative pelvic thrombophlebitis.

Thrombophlebitis (phlegmasia alba dolens, femoroiliac thrombophlebitis).—In the early days this condition was referred to by the laity as "milk-leg." In recent years this homely term has been seen frequently in professional journals; it is immediately associated with an acutely ill patient who has been confined to bed and is convalescing from an infectious disease or the effects of trauma, surgical or otherwise. There is a complaint of painful swollen limb preceded usually by chills, high fever, and possibly nausea. Most of the pain centers around the femoral area and along the medial aspect of the thigh. The involved extremity is too painful to be subjected to the maneuvers called for in testing for Homans' and Moses' signs, and therefore these two tests are not to be considered here. Unfortunately, novices insist on attempting these maneuvers to the distress of the patient.

The pain in phlegmasia alba dolens is due to intense vasospasm which initiates in the venous system from aggravation by the thrombus. Then, by reflex over the autonomic nervous system, the vasospasm involves the arterial tree. The limb becomes grossly edematous, cold, clammy, and, in extreme cases, changes in color from pink to bluish-white (cyanosis)—the color of watered milk; from this comes the term "milk-leg." Much of the edema is of lymphatic origin and is generally nonpitting. The venous return is at a low ebb, and, the main line being obstructed, the lymph system becomes terrifically engorged. The thrombus is of little import in this instance but the vasospasm and overloading of the lymphatics is of great concern.

As soon as the appropriate autonomic nerve pathways are anesthetized, the pain of the reflex vessel spasm, particularly that in the arteries, is relieved. Lumbar sympathetic procaine blocks, low spinal or caudal anesthesias should be used—continuous or repeated as often as necessary. With relief of vasospasm the load is taken from the lymphatics as the venous collateral system becomes relaxed. Adequate drainage of body fluids from the extremity is obtained. As a result of this specialized treatment, the high temperature of the patient drops, he becomes comfortable, and the leg and thigh assume more normal proportions.

On the other hand, if conventional treatment is used and the vasospastic state is allowed to persist, the lymphatics are permanently and irrevocably damaged and the patient is left throughout life to suffer the sequelae, including chronic lymphedema of that extremity. Incidentally the femoroiliac and/or popliteal thrombus remains in situ and gradual recanalization takes place. Occasionally the thrombus propagates a friable snakelike tongue which may break off and lodge in a pulmonary vessel. If the latter occurs, vein ligation and/or thrombectomy should be performed proximal to the nidus of the thrombus.

Phlebothrombosis.—Another thromboembolic phenomenon is phlebothrombosis. Thrombophlebitis and phlebothrombosis are universally confused. It would have been better if phlebothrombosis had been given some name such as Homans' disease—after the man who is given credit for having described it first.[1] Students would then have been relieved of confusing two tongue twisters. It was Ochsner,[2] we believe, who coined the term.

The etiologic factor in phlebothrombosis is much the same as that in thrombophlebitis, that is, confinement to bed or inactivity due to infection or trauma and/or general debility with concomitant blood changes. While thrombophlebitis is prevalent in those under 50 years of age, phlebothrombosis occurs most frequently in those over that age. At first the ankle and foot are slightly swollen but are not painful at rest. The temperature is normal or one-half to one degree below normal. The patient's only complaint is of a "charley-horse" in the calf muscle on ambulating. If the patient is not ambulatory, the nurse or attendant may notice the swelling. The attending physician when called upon to note the swelling will find the edema to be of the soft pitting type and that positive Homans' and Moses' signs may be elicited.

A majority of patients with phlebothrombosis are not recognized as suffering from thromboembolism of the lower extremity until after there is evidence of pulmonary embolism or at postmortem examination. As is to be expected, in teaching hospitals these errors are in the minority. Not too many years ago most sudden postoperative deaths were considered to be due to air embolism, fat embolism, and the like. Today these expressions are rarely heard.

Surgery for phlebothrombosis is the treatment of choice and consists of vein ligation and/or division on the cardiac side of the thrombus. Usually the popliteal, superficial femoral, or common femoral vein is the one sectioned. If the thrombus is suspected of extending into the iliac vein, the femoral vein is exposed and opened between control sutures. If on opening the common femoral vein, the thrombus is found to have entered the iliac vein, aspiration thrombectomy is performed in a cephalad direction. If there is evidence that the thrombus has propagated into both iliacs or higher, we perform a low vena caval ligation. We have at times palpated a thrombus extending up to the level of the renal veins, and in such a case we open the vena cava in its lower expanse between control sutures and employ suction aspiration.

The vena cava can be exposed either transperitoneally or retroperitoneally. In the transperitoneal approach the abdomen is opened by means of a lower abdominal midline incision while the patient is under spinal anesthesia. The peritoneal reflection of the cecum and ascending colon is incised and the cecum and ascending colon are retracted medially, exposing the retroperitoneal space. The vena cava is exposed by means of sharp and blunt dissection. The vessel is then doubly ligated with a nonabsorbable suture in its lower third caudad to the renal veins. With the retroperitoneal route the same approach is used as for right lumbar sympathectomy. The cava lying to the right of the aorta is dissected free and ligated in continuity as above.

One need not be concerned about the venous return from the lower extremities after ligation of the vena cava as many superficial and deep collateral pathways are available.[3] As far as this phase is concerned, the operation can be performed with impunity.

Suppurative Pelvic Thrombophlebitis.—Before turning our summary to unfortunate episodes occurring in peripheral arteries a few remarks regarding septic thrombophlebitis of the pelvis are in order. The common denominator in most cases is infection of the surfaces of the genital tract from the ova to the tubal ostia with associated trauma.[4] Clotting occurs in the pelvic veins in patients with postabortal infections, after gynecologic operations or intrauterine application of radium, or in connection with pelvic abscesses. The clots formed are septic and tend to be purulent; the process of liquefaction predisposes to embolism. The infected emboli tend to be small and are liberated in showers. If a patient fails to improve after 4 or 5 days on a medical regimen or if pulmonary infarction develops, a vena caval ligation should be performed. The ovarian veins can also be ligated at the same time.

ARTERIAL OCCLUSION

Thromboembolic phenomena of the venous tree rarely cause the loss of an extremity but arterial occlusive diseases frequently do. In this paper we shall discuss only those acute incidents due to trauma, embolism, and thrombosis. In the opening paragraph, we mentioned the spectacular surgical measures which can be used to forestall total ischemia. Most of these are highly technical procedures to the novice but we are sure, in the near future, they will seem commonplace. The physician bent on mastering the necessary technics should not fail to study the hemodynamics of normal blood channels so that he can understand altered circulations of occluded arteries and the morbid effects of insufficiency.

If circulatory inadequacy develops in an insidious manner in keeping with average physiologic aging, the patient does not suffer the shock and effects of acute arterial occlusion. The gradual reduction of intraluminal capacity is the greatest stimulant to the development of collateral blood supply in an extremity. This is nature's way of compensation in atheromatosis and arteriosclerosis, in contrast to the sad effects of rapid (acute or subacute) interruption of blood flow. The efficiency of the collateral circulation is inversely proportionate to the rapidity of the occlusion.

Traumatic Arterial Occlusion.—Traumatic interruption of vascular continuity remains a serious threat to both life and limb. Most of these cases are encountered in the armed forces. Because of necessity, while under gunfire, primary ligation of a damaged vessel is the treatment of choice.[5] Twenty per cent of all amputations performed on war wounded have as their basis major vascular damage. The destructive forces of modern military weapons tend to cause jagged defects. Rarely does one see a cleanly severed or lacerated arterial wall. However, as in civilian practice, the smaller arteries are ligated and the major arteries are repaired in one of three ways. Transverse suture is used if the defect is quite small, less than 10 per cent of the circumference of the vessel wall. End-to-end anastomosis is employed in the majority of lesions. Control of hemorrhage is by artery clamps or application of umbilical tapes. The grossly damaged vessel is then excised. The artery is freed proximally and distally and collateral branches sacrificed as necessary to permit apposition. Stay sutures are placed either trisecting or bisecting the circumference of the vessel and the anastomosis is completed with an over-and-over suture or by either an interrupted mattress or continuous everting mattress suture of 5-0 or 6-0 arterial silk on an atraumatic needle. Thirdly, if apposition is not possible, vessel grafting is used to fill the gap. Reparative surgery is recommended in all major acute vascular injuries.

Present facilities do not permit maintenance of a vessel-graft bank. It is hoped that one will be available in the near future. Hence we have utilized in our

cases autografts of adjacent veins or conveniently located veins. Fresh hemografts are used when available. The time elapsing between wounding and surgery is important for obvious reasons. Because of better timing there should be fewer losses of limbs from sudden traumatic arterial interruptions in civilian practice than in military practice. The use of tourniquets can be vicious. Injudiciously used they produce thrombosis not only of the main artery but also of collateral pathways which might have afforded sufficient nourishment to save the extremity.

Even those who do not specialize in the field of peripheral vascular surgery must be prepared to perform a satisfactory anastomosis with the least amount of trauma, using fine suture material and a small atraumatic needle.

Arterial Embolism.—A common cause of acute arterial occlusion is embolism associated with auricular fibrillation, postinfarction mural thrombi, arteriosclerotic plaques, vegetative valvular growths, and so forth. The embolus lodges invariably at the bifurcation of an artery, particularly distal to the lower portion of the abdominal aorta.

An important prognostic factor is the site of occlusion. If it occurs at the bifurcation of either the abdominal aorta or the common iliac artery and a successful embolectomy is not performed, invariably necrosis of the extremity follows. Prognosis is better when the lodgment is below Poupart's ligament.[6] Another prognostic point is the degree of concomitant arteriospasm, a major factor in the preservation or loss of the extremity. The angiospasm spreads not only distally and proximally to the site of occlusion but also throughout the collateral tree. It is confounding to observe the variation in intensity of the arteriospasm as it occurs in different individuals with much the same embolic organic obstruction. In any case, arteriospasm is present in all arterial occlusive diseases and is a component to be dealt with. No doubt many surgeons, in instances of poor judgment, have by their surgical methods aggravated the condition and instituted more constriction of circulation than was good for the patient. This is particularly true of arteriotomy performed in the popliteal area in patients over 50 years of age. We have now concluded that this group of patients has a better prognosis if left undisturbed locally, surgically speaking, but that they should be given immediate antivasospasm therapy (including lumbar sympathetic procaine blocks and lumbar sympathectomy) and heavy anticoagulation therapy. We have abandoned cooling the leg with ice because of uniformly poor results.

Most people over 50 have sufficient atheromatous changes in the popliteal area to preclude successful closing of the arteriotomy wound without undergoing postoperative thrombosis at the site of closure. Suturing of the vessel wall in many instances is like sewing together two soda crackers. However, embolectomy at the level of the common femoral artery or its environs has afforded better results. Antiangiospasm therapy is of great assistance in combating postembolic ischemia and must be instituted early before irreversible tissue changes have set in.

Again, timing is important. The embolus must be removed, if at all possible, before a distally propagating thrombus can form. Indeed, if vascular surgery is contemplated, a spinal anesthetic should be given as soon as possible, even long before the patient is prepared for surgery. We have found age alone to be no contraindication to spinal anesthesia if other conditions are favorable. If later it is decided that surgery will not be performed, the patient can only have benefited from the anesthetic which relieves associated neurogenic arteriospasm.

Arterial Thrombosis.—In contrast to acute arterial occlusion of embolic origin there is arterial thrombosis of arteriosclerosis. The latter may come on insidiously or abruptly. If the onset is slow, nature has much time to promote an adequate collateral circulation so that the patient never develops ischemic necrosis in spite of complete obstruction. If the onset is rapid the patient develops a painful, cold, cyanotic, paralyzed, and pulseless extremity. Treatment of the chronic occlusion of peripheral arteriosclerosis has until recent years been directed toward promoting an optimum collateral circulation. Since that time it has been found that arteriosclerosis in certain individuals is segmental in nature rather than generalized, and we now, in selected cases, direct our treatment to restoration of circulation through the main channel rather than to improvement of collateral circulation by sympathectomy.

In Germany serial arteriography[7] is considered an absolute essential to reliable recognition of vascular conditions. The injection of a radiopaque substance into the aorta at the level of the twelfth thoracic vertebra will demonstrate abnormalities and/or obstructions of the abdominal aorta, iliac, and frequently the femoral arteries. Open or closed injection of the material into the common femoral artery will outline the arteries of the legs.

In selected cases the treatment of acute arterial thrombosis in arteriosclerosis obliterans is resection of the stenosed segment and replacement with a graft. The best graft is a length of saphenous or similar vein. If the obstructed section is in the femoral-popliteal system, shifting of the saphenous vein to bridge the gap of the excised segment is relatively simple and affords a favorable prognosis.[8]

Peripheral vascular episodes frequently result in total ischemia (gangrene) of distal parts of extremities. The majority of such instances occur in the aged with poor cardiovoscular stamina and/or diabetes mellitus. Surgical amputations can be delayed for days or weeks by "physiological amputation," using tourniquet and refrigeration, until the patient's health is improved or his diabetes controlled. Physiologic amputation by refrigeration has saved many lives while preparing these patients for surgery.

In most instances we amputate in the low thigh using Holden's[9] technic. In the last several years we rarely have used bone wax, alcohol injection of the severed nerves, or sutures in the muscle except to obtain hemostasis. Here again we prefer spinal anesthesia. Experience proved it to be the best tolerated, and it also prevents much reflex spasm of the collateral arterial tree which is of such import to the patient's well-being at this time of stress.

We conclude this resume of common incidents affecting peripheral vessels by emphasizing the importance of a knowledge of normal and altered hemodynamics and neurovascular balance.

SUMMARY

We have discussed the frequent pathologic episodes that occur in the peripheral vessels. For these, we have tried to elucidate several surgical approaches and specialized treatments.

Thrombophlebitis and phlebothrombosis can best be considered as two different disease entities.

Enhancement of collateral circulation in arterial occlusions has been stressed, as well as surgical timing.

The best approach to surgery of the vascular system is a profound study of normal and deranged hemodynamics.

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The Preceptor Training Program of The American College of Osteopathic Surgeons

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The Preceptor Training Program, as its name implies, differs from a residency type of training program in that the program of the trainee is the direct responsibility of the preceptor, and not of the hospital in which the program is conducted.

The program was devised to accommodate those individuals who for one reason or another are unable to participate in a formal residency training program and to insure that upon completion of the program the trainee would be equipped with the basic requirements for the practice of surgery. In no way is the preceptor program to be considered as a means of circumventing or eliminating the formal residency training programs under the jurisdiction of the Bureau of Hospitals of the American Osteopathic Association. In the osteopathic profession there are many individuals who find it necessary to participate in training programs other than residency programs approved by the Bureau of Hospitals.

As of January 1, 1951, all physicians conducting preceptorship training programs in the specialty fields of surgery, the subdivisions of surgery, and anesthesiology and all physicians entering preceptorship training programs in the specialty fields of surgery, the subdivisions of surgery, and anesthesiology must meet certain requirements to insure accreditation of the training program.

When a preceptor training program has been registered and approved by the Evaluating Committee of the Register of Training Programs of the American College of Osteopathic Surgeons, the trainee is assured that the work done by him in this program will be approved and made a matter of record. When the program is not registered and not approved, there is always the possibility that the training may not be acceptable when and if the physician makes application for membership in the American College of Osteopathic Surgeons, or applies for examination before the American Osteopathic Board of Surgery.

In the proceedings of the Evaluating Committee for the Register of Training Programs, the qualifications of the preceptor have been a matter of great concern. The importance of the teacher in any such program is paramount.

The basic requirements for approval as a preceptor in a surgical or anesthetic training program have been published in the brochure, "Register of Training Programs, American College of Osteopathic Surgeons," and for the purpose of emphasis are repeated in this presentation:

1. The physician, by nature and temperament, must be qualified as a teacher.

2. The physician must be certified in his specialty field or, in lieu thereof, must be a member of the American College of Osteopathic Surgeons.

3. If a physician is neither a certified specialist nor a member of the American College of Osteopathic Surgeons but has, in the opinion of the Evaluating Committee, the qualifications necessary for either certification or membership, he may be designated as a Preceptor.

4. The physician must have access to sufficient clinical material to enable him to present, during each year, the minimum number of cases required by the American College of Osteopathic Surgeons and the American Osteopathic Board of Surgery in the specialty field under consideration.

5. The physician must show evidence of being sufficiently well grounded in the required basic sciences and have available adequate teaching facilities to present these subjects in his training program to the Trainee, or may join with one of the regularly approved colleges or acceptable institutions where these subjects can be presented.

The next subject of investigation is the trainee. The basic requirements for approval as a trainee in a surgical or anesthetic training program are:

1. The physician must have been graduated from an approved osteopathic college.

2. The physician must be and continue to be a member in good standing of the American Osteopathic Association and of his state or divisional society.

3. The physician must have satisfactorily completed a minimum of one (1) year's rotating internship in a hospital approved for intern training by the Board of Trustees of the American Osteopathic Association or in an institution acceptable to the American College of Osteopathic Surgeons and the American Osteopathic Board of Surgery. If graduated prior to 1943, the physician must have had training of value equivalent to that of an acceptable internship. (Five (5) years of general practice is the minimum acceptable equivalent for an internship for physicians graduating prior to 1943.)

The third factor which is considered is the program as submitted by the preceptor. The basic require-

ments for approval of a training program in one of the surgical specialties or anesthesiology are:

1. The program must be conducted by an approved Preceptor. In certain instances where the volume of work does not meet the requirements, two preceptors may join to conduct the training program of one trainee, providing the volume and variety of surgery meet the basic requirements for the program.

2. The program must occupy at least 50% of the professional time and effort of the Trainee.

3. The program must provide the Trainee with:

a. Sufficient clinical work which must be conducted in an osteopathic hospital approved for intern training by the American Osteopathic Association or a hospital or institution acceptable to the American College of Osteopathic Surgeons and the American Osteopathic Board of Surgery.

b. A reading program prepared by the Preceptor in relation to the specialty and satisfactory to the Evaluating Committee.

c. The Trainee shall provide evidence to the Evaluating Committee that he has received satisfactory postgraduate training in the basic sciences including anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

d. Those applicants who qualify must submit acceptable documentary evidence which may be further investigated at the discretion of the Evaluating Committee, of having pursued this advanced training in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to the Evaluating Committee.

e. A minimum of one hundred (100) clock hours shall be required in the basic science program, subdivided as follows:

(1) A minimum of ten (10) hours each in the following subjects: anatomy, physiology, biochemistry, pathology, and pharmacology.

(2) The remainder of the minimum required hours may be made up in any of the subjects mentioned, or in any other basic sciences related to the specialty.

f. Active experience in the diagnosis and treatment of sufficient amount and diversity to insure adequate training in the specialty.

Because of the diversity of training programs which have been under consideration, there have been two general classes considered under this program:

Class I: Those training programs in which the Trainee devotes his entire time to the training program and carries on no private practice or other business activities. The minimum period for approved full-time surgical training programs (Class I) shall be of not less than three (3) years' duration, but does not necessarily have to be three consecutive years.

Class II: Those training programs in which the Trainee devotes a minimum of 50% of his professional activities to the training program. The minimum period for approved part-time surgical training programs (Class II) shall be of not less than five (5) years' duration, but does not necessarily have to be five consecutive years.

The Preceptor Training Programs in anesthesiology are to be evaluated and classified on an individual basis, according to the established requirements for examination and certification in Anesthesiology by the American Osteopathic Board of Surgery.

Credit shall be given the Trainee for post-graduate work in surgery or the surgical sciences taken in any of the graduate school programs approved by the American College of Osteopathic Surgeons and/or the American Osteopathic Association.

In order to be approved as the equivalent of one (1) year's fulltime surgical training, the post-graduate work shall consist of a minimum of one thousand (1,000) clock hours. Not more than one (1) year's credit shall be given any Trainee for post-graduate work in an approved graduate school program.

The trainee should keep an active log of his work during the years of his training program, which should properly include description of his work in pathology laboratory, the x-ray laboratory, the operative first assistantships, and such operative procedures as he may perform during the training program under the supervision of the preceptor.

Surgical procedures performed on the responsibility of the trainee or under the supervision of the preceptor during the period of training will not be considered as credit toward fulfilling Item 7 of the requirements for membership, "He shall provide notarized documentary evidence that he has performed a minimum of two hundred major surgical operations upon his own responsibility subsequent to the completion of the minimum required period of formal training."

Upon request by the preceptor and trainee, the secretary of the American College of Osteopathic Surgeons will furnish application forms and upon submission of this documentary data the Evaluating Committee will study this information and arrive at a decision as approving or disapproving the program. These applications must be in the hands of the secretary prior to May 1 of the year in which they are to be considered.

When any program has been approved, the trainee and preceptor shall be required to complete an annual report for the Evaluating Committee of the Register of Training Programs for further study and continued approval of this program. Such reports are to be in the hands of the secretary of the American College of Osteopathic Surgeons prior to May 1 of the year in which they are to be considered.

This requirement for the submission of forms at the designated time would appear to be the great stumbling block in the pathway of many of the individuals who wish to have their programs approved, for the secretary receives many applications after the deadline. This accounts for the failure of the Committee to consider such programs.

When, in the opinion of the Evaluating Committee, the basic requirements have been completed in the training program, the individuals concerned are so notified by the secretary of the American College of Osteopathic Surgeons.

All of these statements have been published on several occasions in the *Bulletin of the American College of Osteopathic Surgeons* and are to be found in the "Register of Training Programs," which has been available to individuals requesting information. However, there probably will continue to be those individuals who have programs at variance with the printed requirements and in such cases must be considered by the Evaluating Committee on an individual basis.

Neither the American College of Osteopathic Surgeons nor the American Osteopathic Board of Surgery has developed any official formula for approved surgical training programs other than the outline contained in the "Register of Training Programs" information folder.

No two hospitals in the osteopathic profession have identical facilities or personnel, and therefore the objective has been to make requirements sufficiently firm to assure adequate training to trainees and yet be sufficiently flexible to enable any approved hospital to provide the facilities for the conduct of an approved preceptorship training program.

At the present time, I do not believe there is any mechanics to obtain approval of internships or surgical training obtained in nonosteopathic hospitals other than

the Register of Training Programs of the American College of Osteopathic Surgeons and the American Osteopathic Board of Surgery.

The American Osteopathic Board of Surgery has authority, in accordance with the Constitution and By-laws approved by the Advisory Board for Osteopathic Specialists and the Board of Trustees of the American Osteopathic Association, to accept internships served in nonosteopathic hospitals, and on several occasions has admitted to examination physicians who have served their internship in such hospitals prior to December 31, 1948. The 9-month internship in vogue during World War II has been accepted by both the American Osteopathic Board of Surgery and the American College of Osteopathic Surgeons for those physicians who served internships at that time.

Constantly, the secretary and the Committee are confronted with questions evolving around changes in the rules and regulations which occur from time to time. The continuing policy of all the evaluating bodies of the American College of Osteopathic Surgeons and the American Osteopathic Board of Surgery are as follows:

1. Physicians entering a specialty training program are governed by the requirements in force at the time their training program commenced.

2. Changes made in the requirements or regulations of a training program in any specialty subsequent to the physician commencing the training program are not retroactive and do not affect physicians who entered acceptable training programs prior to the date of approval of the new requirements by the Specialty Board and the Advisory Board for Osteopathic Specialists.

By the establishment and maintenance of the "Register of Training Programs" by the American College of Osteopathic Surgeons an active list of approved preceptor training programs is available which will provide information to prospective trainees on approved surgical or anesthetic training programs.

12 S. Twelfth St.

Choice of Procedure in Primary and Secondary Repair of Facial Injuries and Deformities

GOLDEN S. RAMBO, D.O.
Los Angeles

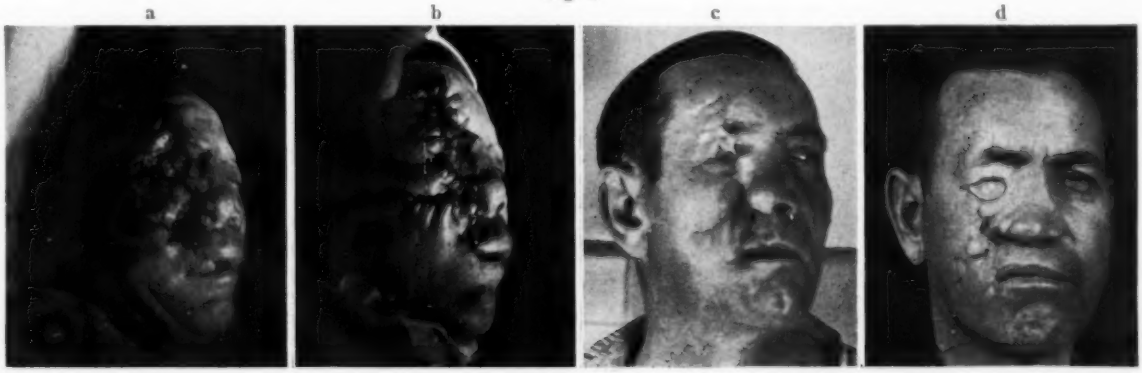
The purpose of this paper is to illustrate some procedures I have used in primary and secondary repair of facial injuries and deformities. The author takes no credit for originating these procedures, however. It is often necessary to improvise in order to utilize the material at hand as illustrated in Case 1.

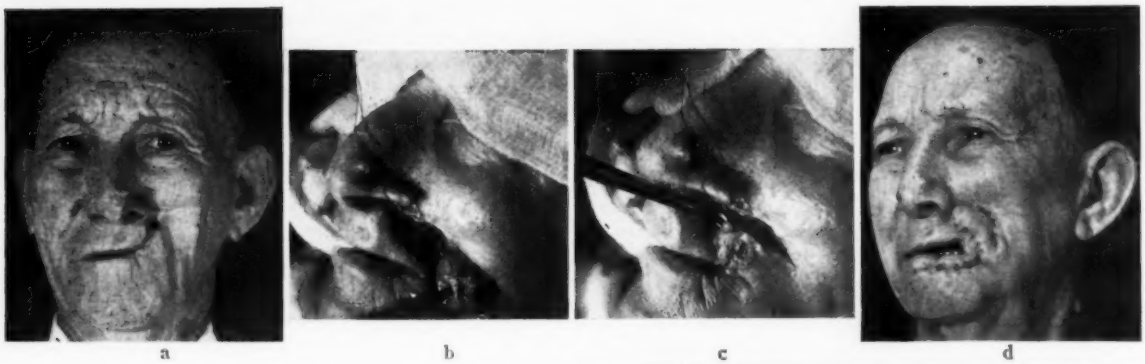
CASE REPORTS

Case 1. Male, aged 48. Patient in the Los Angeles County General Hospital—Unit 2. This case will illustrate the use of a composite rotation flap to fill in a defect caused by the firing of a shotgun from inside the mouth. There is still a disagreement as to who put the gun in the patient's mouth and who pulled the trigger. The police reported all involved persons under the influence of alcohol. This explosion took with it the left half of the hard palate, the medial wall of the antrum, the anterior wall of the antrum and most of its coverings, and the right eye. Figure 1a illustrates the loss of tissue. In this particular case about one third of the upper lip, extending from the vermilion border to the defect and including all layers, was utilized as a flap and rotated into a superior position in an effort to fill the defect occasioned by the loss of tissue. The vermilion border was denuded so that the composite flap could be attached to the medial margin of the upper lip laceration. The apex of this flap reached to what remained of the right ala as illustrated in Figure 1b. An incision through all layers, from skin to periosteum, was made from before backward, beginning at the lower lateral portion of the defect in order to produce a series of two flaps. The second flap was completed by extending the forehead laceration lateralward. All layers of tissue, except periosteum, over what remained of the supraorbital ridge and the superior maxilla were elevated and moved en masse to a more medial position.

The secondary repair involved other procedures. Approximation of macerated tissue often leaves a skin defect such as occurred in this case. The defect was temporarily covered with a Thiersch graft 1/10,000 of an inch in thickness, as shown in Figure 1c, extending vertically along the right side of the nose over the

Fig. 1





a b c d

Fig. 2

e f

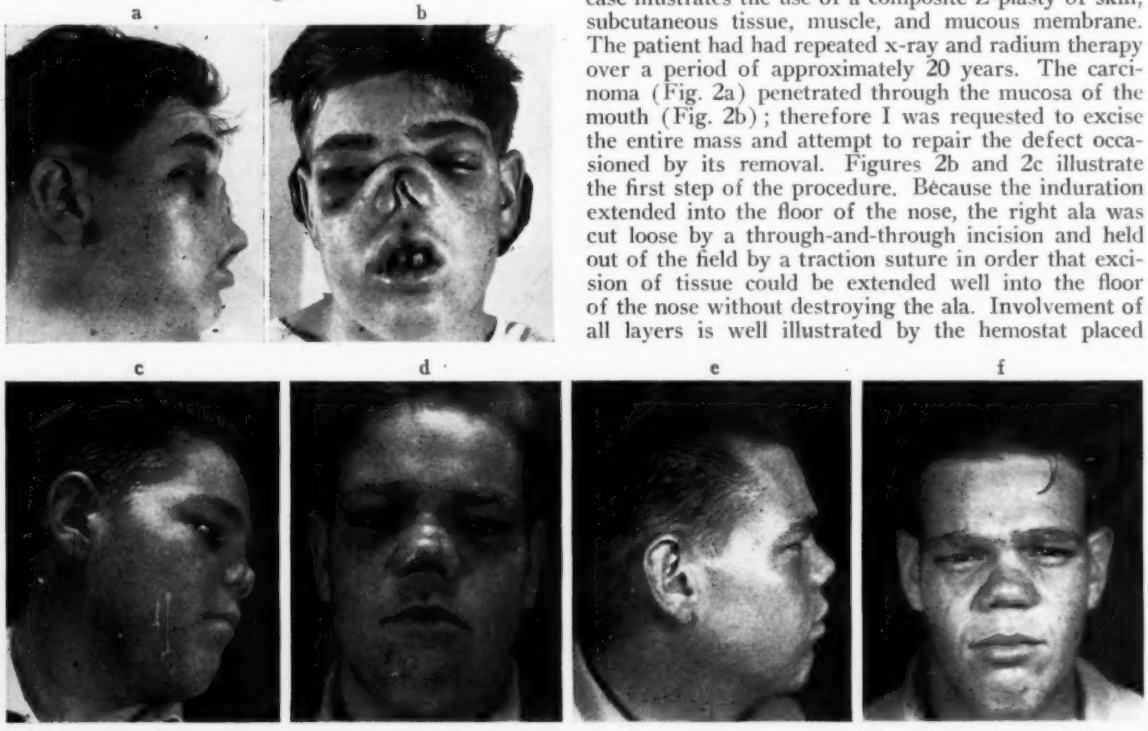
frontal process of the maxilla. It should also be noted at this time that the scar line from the right angle of the mouth to the right ala had undergone considerable contracture, pulling the right corner of the mouth upward. To cure this defect a Z-plasty through all layers, skin to mucous membrane, was done at the right corner of the mouth, transplanting a flap from the lower lip around the corner of the mouth to a position in the upper lip, thus depressing the right corner of the mouth.

A Gillies' tube had to be raised and migrated to the vicinity of the nose in order to reconstruct a right ala and fill in the defect which had temporarily been covered by a Thiersch graft. An eye socket was excavated, then lined with a Stent graft, and fitted with a prosthesis as shown in photograph 4, case 1.

Because of the intoxication at the time of the accident there still remained a decision as to whether the injury was to be classified as attempted suicide or attempted murder. For this reason the patient was transferred to Unit 3 for psychiatric observation after which he was transferred to Unit 1 where the last two procedures were performed. The patient then returned to Unit 2 for the repair to be completed. Examination of the right ala revealed that some trimming operations are still indicated (Fig. 1d).

Case 2. Male, aged 76, had a basal cell carcinoma just lateral to the left ala which had been adjudged radiation resistant by Dr. Wilmot F. Robinson. This case illustrates the use of a composite Z-plasty of skin, subcutaneous tissue, muscle, and mucous membrane. The patient had had repeated x-ray and radium therapy over a period of approximately 20 years. The carcinoma (Fig. 2a) penetrated through the mucosa of the mouth (Fig. 2b); therefore I was requested to excise the entire mass and attempt to repair the defect occasioned by its removal. Figures 2b and 2c illustrate the first step of the procedure. Because the induration extended into the floor of the nose, the right ala was cut loose by a through-and-through incision and held out of the field by a traction suture in order that excision of tissue could be extended well into the floor of the nose without destroying the ala. Involvement of all layers is well illustrated by the hemostat placed

Fig. 3



a b c d e f

through the carcinomatous defect (Fig. 2b). The through-and-through flap was amputated and marked with sutures on all sides and sent for biopsy. The next problem was to correct the defect occasioned by the loss of tissue from the carcinomatous area. This was accomplished by extending a through-and-through incision from the defect around the left corner of the mouth, through the lower lip just below the vermilion border well past the midline, thence downward, and thence lateralward detaching a composite flap. This flap was rotated into the defect and sutured. The ala was then repositioned and the vermilion border was attached to what remained of the lower lip as illustrated in Figure 2d taken on the seventh postoperative day before the sutures were removed. Figure 2e shows the appearance of the patient 1 month after operation. The puckering of the skin lateral to the left corner of the mouth was removed at a subsequent date. One year after operation there was no evidence of return of carcinoma, and the nerve supply to the lower lip had begun to regenerate. Figure 2f visualizes the patient 5 years after operation. The patient, now 82, was examined last month, and no evidence of return of carcinoma was observed.

Case 3. Male, aged 14, was seen at Los Angeles County Osteopathic Hospital after injury in an auto collision. The nose, because of the prominent position it occupies, is perhaps more vulnerable to injuries than any other portion of the face. The plastic surgeon when attempting an immediate repair must bear in mind that secondary procedures will be necessary to gain the desired result. The maceration of tissue associated with ordinary injuries causes the infiltration of considerable scar tissue which must be excised at a later date. This principle is visualized in the following case (Figs. 3a and 3b). It will be noted that the entire cartilagenous portion of the nose was invaginated into the nasal vault. The upper lateral cartilages, being separated from the distal end of the nasal bones, were telescoped beneath the bony dorsum of the nose. The lower lateral cartilages and skin were lacerated through and through.

The immediate repair consisted of delivering the upper lateral cartilages from the nasal vault and maintaining them in position by means of a Kazanjian splint. The lower lateral cartilages and the skin of the tip of the nose were approximated and sutured. Figures 3c and 3d show the result of the immediate repair. The scarring on the tip of the nose was due to the masceration of the tissue at the time of the injury. At the end of approximately 1 year a secondary repair was attempted to excise the cicatricial tissue and reposition the lower lateral cartilages; Figures 3e and 3f show the result.

Case 4. Male, aged 39, an epileptic, struck the left supraorbital ridge against concrete during a grand mal seizure. The result was a comminuted fracture of the supraorbital ridge and the anterior wall of the left frontal sinus. He was subsequently admitted to the Los Angeles County Osteopathic Hospital and assigned to the service of neurology. Dr. Philip B. Davis performed the primary operation. He found the left supraorbital ridge and anterior wall of the left frontal sinus so comminuted that it was impossible to support the fragments in position and for this reason removed the anterior wall of the left frontal sinus and the major portion of the left supraorbital ridge. He also found a comminution of a portion of the posterior wall of the frontal sinus

a b

Fig. 4

approximately 1 cm. in diameter which, in his judgment, had to be removed. The patient made an uneventful recovery and was transferred to the College of Osteopathic Physicians and Surgeons Clinic, where he again was assigned to the department of neurology. Dr. K. G. Bailey conducted the management of grand mal and referred him to the plastic surgery service for reconstruction of the deformity of the supraorbital ridge and the left side of the forehead.

The depression in the forehead can be seen over the left eye (Fig. 4a). The left eyebrow was carried high above its normal position caused by cicatricial contracture of the skin and subcutaneous tissue following the removal of supporting bone. In the selection of a method of reconstruction a tantalum plate was considered but immediately discarded because, as is commonly known, a tantalum plate subjected to severe trauma will be expelled by the tissue. The patient, as mentioned above, is a victim of grand mal and would not be able to protect himself against subsequent injury to the same location. We therefore elected to use bone from the ilium. As all specialty services are represented at the College of Osteopathic Physicians and Surgeons Clinic we secured the aid of an orthopedic team. The plastic team elevated a forehead flap extending up behind the hairline which had to be dissected free from the dura mater. The orthopedic team, headed by Dr. Arthur Miller, worked simultaneously obtaining a slab of external plate of ilium sufficient to repair the defect. The contour of ilium was almost perfect, needing only a few corrections to fit the natural curve of the forehead. This slab was mortised into the frontal bone, the medial portion of the supraorbital ridge, and laterally into the zygoma just lateral to the frontozygomatic articulation. Using a No. 14 Alexander mastoid gouge the orthopedic team supplied a half-round strip of cancellous bone which was used to build up the supraorbital ridge to match the one on the opposite side. The flap was then repositioned and closed with interrupted sutures. The result is shown in Figure 4b.

CONCLUSION

The neophyte attempting to memorize the different curves of the ilium is rarely aware how valuable these particular curves can be for reconstruction in some other part of the body.

The end result of a primary or secondary repair or an attempted reconstruction is more dependent upon the surgeon's planning and choice of procedure than any other one factor.

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Hernia and Its Repair

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The problem of enormous incisional hernia and large inguinal hernia with tissue deficiency has long been an enigma that every surgeon has had to face time and again. Patients who have large incisional hernias are frequently poor risks because of obesity or some cardiovascular or renal problem. In the repair of inguinal hernia with tissue deficiency the problem may be complicated by previous attempt at surgical repair or by the age of the patient.

Large defects of the abdominal wall incident to incisional hernia may be difficult to repair by any type of procedure. At times there may be inadequate tissue to cover such a defect, or the tissue may be adequate for covering the defect but be so lacking in strength that a foreign material must be employed. Metallic mesh in the form of tantalum or Surgaloy is suitable for hernia repair when the patient's own tissues are inadequate or unsuitable for bridging a tissue defect. This material is strong, pliable, and biologically inert. The mesh acts as a scaffolding for the ingrowth of sturdy, white, fibrous tissue for firm closure.

Experimental studies of the tissue reactions to tantalum mesh and Surgaloy mesh have been well documented in the literature.[1] It is now known that there is a marked fibrous reaction around and through the implanted mesh, and that this is a normal fibroplastic reaction which produces soft pliable wound repair. The mesh is resistant to infection so that good healing takes place in the presence of gross infection. Use of wire mesh with good clinical results is now well established and needs no further elaboration.[2,3] Its use, both in the form of tantalum mesh and Surgaloy mesh, is widely practiced. Satisfactory repair of eventration of the diaphragm and repair of diaphragmatic hernia have been reported with no harmful effects to lung tissue.[4,5]

It should be pointed out that it is not good surgical judgment to use foreign material to bridge a tissue defect where there is adequate tissue of good strength. The use of wire mesh should be reserved for those cases presenting a problem in closure because of lack of tissue at the site of the defect or, in the judgment of the surgeon, tissue inadequate in strength to hold and ultimately effect adequate repair. Furthermore, the use of wire mesh can never be a substitute for poor surgical technic. The proper approximation of anatomic structures in hernia repair is important. Failure to adhere to this dictum will account for many failures.

Throckmorton[6] has well stated, ". . . All sutures holding the implant in position should be placed in strong white fascia or periosteum and the dissection must expose these structures adequately. The dimensions of the implant are limited not by the size of the actual defect to be covered, but by the position of *reliable* supporting structures. . . . The implant must be of such generous proportions that it can be sutured in place *without tension.*"

At the Oklahoma Osteopathic Hospital, with the use of tantalum or Surgaloy mesh, a total of ten hernia repairs was performed between January 3, 1952, and February 10, 1953, in my surgical service. Of these cases, four were postoperative incisional hernias; three were umbilical hernias; two were recurrent inguinal hernias; and one was a large indirect inguinal hernia in an aged male.

All of the ventral hernias were large and presented a problem of closure because of repeated recurrences or faulty tissue. The umbilical hernias were in aged patients presenting obstructions or partial obstructions, and closing them was a problem because of their size. The preliminary approximation of tissue layers, although accomplished, was obviously inadequate, so a mesh patch was used to reinforce the insecure closure. All cases have been followed from 4 to 10 months postoperatively, and excellent results were obtained in nine. One patient who had recurrent inguinal hernia has, on coughing, a bulging defect at the site of the external ring. Healing occurred in all cases by primary intention and without infection. In several it was felt necessary to use small umbilical tape wicks for subcutaneous collections of serosanguineous exudate.

In the repair of these hernias, tantalum or Surgaloy mesh was cut large enough to cover the hernial defect and to provide a secure attachment for its borders to strong fascial supporting structures. The margins of the patch were folded under for about 1 cm. to provide a smooth edge and a double thickness for holding the suture. The suture material used to secure the wire patch was tantalum wire or Surgaloy wire. All sutures were placed so as to fasten the borders of the mesh patch onto strong supporting structures of white fascia without tension. The sutures were applied interruptedly, tied with a square knot, and cut close to the knot. Combinations of spinal and Pentothal anesthesia or cyclopropane and Pentothal were used.

CASE REPORTS

Case 1. A 61-year-old woman weighing 230 pounds was admitted to the hospital with a chief complaint of cramping in the lower left quadrant of the abdomen. Her large pendulous abdomen presented a massive umbilical hernia overhanging the lower one-third. A scout film on admittance showed a typical laddering gas pattern of obstruction. A lateral view showed distended loops of the small bowel scattered throughout the upper portion of the abdomen and anterior to the abdominal wall was a large hernial sac which contained scattered areas of gas. The hernia had been present for 30 years. The patient had anorexia for a week prior to admittance and two days prior to admittance had nausea and vomiting. Aside from obesity and a fluid imbalance, her general condition was satisfactory.

There was hemoconcentration manifested by a red cell count of 6,450,000 and 15 grams of hemoglobin per 100 cc. A 1-plus albuminuria was accompanied by a microscopically negative urine. An interesting sidelight was that the patient had for a long time worn around her neck a sling that she designed. It basketed the abdomen much like a hammock and supported the pendulous abdomen and massive hernia. Following are the operative findings and proceedings: There was a large tumor the size of a 2-gallon bucket protruding from the abdomen. The skin was thin with irregular areas of concavities and convexities representing coils

of intestines. There was tension of the tumor mass at the base; however, the tip of the mass was not under tension, and the skin could be picked up with the fingers.

In order to prepare the underlying skin, the mass was held up by grasping the skin with three Ochsner forceps while the nurse scrubbed beneath it. The hernial sac contained a portion of the omentum, the cecum, the ascending colon, the hepatic flexure and part of the transverse colon, and approximately 20 inches of the terminal ileum. A transverse eliptic Mayo-type incision planned for adequate closure of the skin was made at the base of the mass. Because of rents and infarcted areas, much of the omentum was resected. The large and small bowel were held in the sac by plastic adhesions of the omentum to serosa and in turn to the thickened peritoneal sac. These were freed by blunt and sharp dissection. Tantalum mesh, approximately 16 cm. by 10 cm., was fixed over the closed peritoneum to the understructure of the external fascia. Prior to this, a portion of the rectus muscle on either side was pulled toward the midline. In some areas there was enough fascia present to use a mattress suture to imbricate the fascia. Near the center of the defect the fascia was merely pulled into the tantalum mesh. Umbilical tape was used in the skin for drainage of serosanguineous exudate. Aside from the need for adequate medical regimen to correct the patient's fluid imbalance and the use of gastric suction for 24 hours, her convalescence was uneventful. Because of her weight, which made ambulation difficult, it was delayed until the third postoperative day. Her total stay in the hospital was 10 days.

At the 8-month postoperative checkup there was no evidence of weakness of the abdominal wall, and, needless to say, the patient was most grateful for being able to abandon the sling which she had used for so many years to support the hernial mass.

Case 2. This case has some of the same features as Case 1. The patient, a 72-year-old woman, was admitted with an umbilical hernia the size of a 1-gallon bucket. The hernia was under pressure, and attempts at taxis had failed. There was marked tenderness over the hernial mass.

An anteroposterior scout film on admittance showed large distention of the colon in what appeared to be from the hepatic flexure to the spleenic flexure, which was out of position and resting over the sacrolumbar articulation. The bowel was distended to an average size of 4 inches. The haustral markings were still visualized. In the lateral view this loop of bowel was seen to be anterior, just within the belly wall, indicating the possibility of herniation.

The clinical finding at the time of admittance was massive umbilical hernia with strangulation. This patient's cardiac status was good. Her blood pressure was 120/65 and her physiologic age, from a clinical viewpoint was below her chronologic age. The onset of her symptoms occurred 2 days prior to admittance. She had been admitted to another hospital and then was transferred after 48 hours to the Oklahoma Osteopathic Hospital.

The hernial sac contained a portion of the large bowel which proved to be the transverse colon; it was large and dilated. The opening was judged to be 10 cm. in diameter, and the fascia at the edge of the ring was indurated. The serosa of the large bowel had a good color. The muscle areas were thinned out and were of no use in bridging the gap of this defect. The fascia was closed over tantalum mesh, as previously described. There was inadequate fascia to approximate the edges in the center; therefore, the fascia was merely pulled into the mesh. Umbilical tapes were used for drainage of the subcutaneous layer. This patient's hospital stay was 10 days, and her recovery was uneventful. The abdominal wall was firm at the 4-month postoperative checkup.

Case 3. As mentioned previously, often incisional hernias may be complicated by cardiovascular problems. This patient, a woman aged 76, was admitted to the hospital with a known history of hypertension and left bundle-branch block associated with sclerotic heart disease. She had suffered an attack of protracted coronary insufficiency with angina. She developed acute heart failure with marked pulmonary edema which required active treatment with digitalis, mercurial diuretics, oxygen, and low salt diet. In the interim between the attack and admission, the patient had considerable cough, which resulted in strangulation of the omentum into a ventral hernia in the midline below the umbilicus. This incisional hernia had followed surgery 34 years before.

Upon improvement of her cardiac status, a repair of the hernia was undertaken. The hernial sac, when opened, contained infarcted omentum about the size of an orange with free serosanguineous fluid in the sac. The muscle fibers were approximated at the upper and lower portions of the incision but could not be pulled over the midportion of the defect. Tantalum mesh, 9x7 cm., was used. The rectus fascia was closed, imbricating the fascia in the areas where it was adequate. This patient was dismissed in 9 days following surgery. Her condition was satisfactory.

Case 4. A woman, aged 69, was admitted to the hospital with umbilical hernia the size of a half-gallon bucket, partly reducible, producing pain and periods of obstipation. The patient was short and obese and in the past there had been some dyspnea associated with hypertension. Her electrocardiogram indicated sclerotic heart disease. Her lung fields were dry, and x-ray of the chest revealed left ventricular hypertrophy without evidence of decompensation, as manifested by pulmonary congestion.

When opened, the hernia contained omentum and a portion of the small bowel. The omentum was adherent to the sac. The fascia was freed for a distance of 2 or 3 cm. from the edge of the hernial ring. In this area a piece of tantalum mesh cut to size was sutured in place. Small umbilical drains were used in the incision. This patient did not present a problem of obstruction, and surgery was undertaken on an elective basis. She has not been seen postoperatively since she lives a considerable distance from this hospital. However, her physician reports that her condition has been satisfactory.

Case 5. Two years previously this patient, a woman aged 65, had undergone an appendectomy which was followed by a ventral hernia. The following year she underwent surgery for the repair of this hernia. A few weeks later, the hernia recurred. She was a rather obese person, weighing 165 pounds, and clinical examination disclosed mild hypertension; however, her cardiac status was good. There was considerable pain at the site of the hernia, and no type of support successfully maintained reduction.

The muscle structures were thin and of poor quality. A piece of Surgaloy screen mesh was cut to fit an

area approximately 17 cm. in length and 10 cm. in width and fixed under the external fascia. There was adequate fascia to bring the edge of the fascia layer over this mesh except near the center of the operative field; the edge of the fascia in this area was fixed in the mesh with individual ties using Surgaloy suture. Umbilical tape was placed in the incision.

Because of this patient's previous surgical experience, it was difficult to obtain her cooperation in ambulation; however, with some persuasion, on the fourth postoperative day she became ambulatory and thereafter was cooperative. Her hospital stay was 17 days, not because of any complication but at her request. It was my impression during my daily visits with her that she anticipated recurrence of the hernia at any moment, and she actually had to be persuaded to return to her home on the seventeenth day. The patient has been seen at monthly intervals and, at her four-month checkup, was in excellent condition with a strong abdominal wall.

Case 6. The patient in this case was a woman aged 65, of medium build, slightly obese, and weighing 151 pounds. Her abdomen was rather pendulous. She had had an appendectomy 4 years before and following this, an incisional hernia occurred which could, however, be reduced. It was about the size of an orange. There was no tenderness at the area. The patient requested repair of this hernia because of a sister's experience with strangulated hernia.

There was nothing remarkable in her physical examination; her cardiac status was good, and it was felt she was a good surgical risk. The hernial sac contained omentum which was fixed to the sac. A portion of omentum which appeared semi-infarcted was excised. The muscle had thinned out; it was approximated by interrupted sutures. Because of this patient's age and a lack of adequate fascia for imbrication, a piece of tantalum mesh was cut to size, approximately 9 by 9 cm., and placed over the hernial defect. No skin drains were used. Her recovery was uneventful; she was ambulated early and dismissed on the seventh day. A 10-month follow-up was made, and her condition was good.

Case 7. This 55-year-old woman had undergone appendectomy 2 years previously. This was followed by a ventral incisional hernia 2 weeks later. When the patient came under my care she weighed 206 pounds, and her blood pressure was 190/100. After 15 months of dietary and medical regimen, her weight was reduced to 143 pounds and her blood pressure to 135/80. The patient had considerable pain at the site of the hernia and had been unable to work. Physical examination and laboratory findings were essentially negative. She was taking Dilantin sodium for attacks of petit mal. A neurologic survey done at the University Hospital and made available to me was essentially negative. Her electroencephalogram and pneumoencephalogram were interpreted as being negative. There had been no treatmen advised, and the neurologic consultants saw no reason why herniotomy should not be undertaken in an attempt at rehabilitation since she was unmarried and solely dependent upon a salary for her existence.

The sac was found to contain a portion of the cecum, and the omentum was adherent to the hernial sac. The cecum and omentum were freed by sharp dissection. The muscle was approximated with interrupted sutures. Surgaloy mesh, cut to the size of the defect, approximately 15 cm. by 9 cm., was fixed under the fascial area. At the upper and lower portions of the incision, the fascia was imbricated by multiple mattress sutures. One umbilical tape wick was placed in the wound. This patient's postoperative convalescence was uneventful. She was dismissed from the hospital on the eighth day. Dilantin sodium was given orally starting on her second postoperative day. Early ambulation was employed. At her 2-month checkup this patient had no soreness in her abdomen and no evidence of weakness of the abdominal wall.

Case 8. A man, aged 46, had a large, recurrent, direct inguinal hernia on the right side. His first operation in 1949 was complicated by postoperative swelling of the right testicle. On the fourteenth postoperative day a second procedure was undertaken. The patient was unable to relate what was done. The hernia recurred, gradually enlarging. In the interim he also developed a left indirect hernia. On the right the hernia defect was large, with marked scar tissue, and operation revealed the spermatic cord incorporated within this tissue. The canal was closed by approximation of the transversalis fascia about the cord at the internal ring, and the lower edge of the rectus sheath was approximated to the shelving edge of the inguinal ligament. Surgaloy mesh was cut to size and placed over these structures. The mesh patch of Surgaloy was placed under the aponeurosis of the external oblique, allowing the cord to lie below the patch. The aponeurosis of the external oblique was approximated by Surgaloy suture. The left inguinal hernia was repaired by a classical Bassini procedure. The patient was ambulated early with an uneventful convalescence. The total hospital stay was 7 days.

Case 9. A man, aged 58, had a history of left hernia repair 6 years before, with recurrence. A second repair 1 year before admission was unsuccessful. Examination disclosed a large left direct inguinal hernia. Three months prior to admittance, the hernia recurred from lifting a large piece of heavy metal. The repair was carried out in the same manner as Case 8. After repair there was a bulging defect at the site of the external ring on coughing. The existence of this defect, in all probability, was due to the inadequate size of the mesh patch.

Case 10. The third case of inguinal hernia was that of a man, aged 88. There was a massive early strangulated indirect hernia on the left. Tantalum mesh was employed in this case because of the poor quality of tissue due to the patient's age. The patient was ambulated early, and his hospital stay was 7 days. There were no complications. The 3-month postoperative checkup disclosed satisfactory results.

SUMMARY AND CONCLUSIONS

1. The repair of ten hernias with tantalum mesh or Surgaloy mesh is reported. Four of these hernias were postoperative incisional hernias, three umbilical hernias, two recurrent inguinal hernias, and one an early strangulated inguinal hernia in an aged male. All had tissue defects or structure so faulty that repair by layer closure, utilizing the patient's own tissue, did not seem feasible.

2. Related medical problems of obstructions, obesity, and cardiovascular complications are reviewed.

3. The recentness of the operative procedures does not permit adequate follow-up studies in this small series of cases.

4. It is pointed out that the wire patch to be used in repair should not be limited to the size of the actual defect to be covered but should be determined by the

position of the reliable supporting structures.

5. Tantalum or Surgaloy mesh of adequate size and properly fitted is a suitable material for use in types of hernia which present difficult problems of closure because of tissue deficiency.

101 Pythian Bldg.

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Myasthenia Gravis Treated by Thymectomy

With a Case History

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Myasthenia gravis is an illness characterized by easy fatigability and weakness of striated muscles. The condition is much more prevalent in females than in males and most commonly is manifest during the third decade of life, although Randt[1] states that the onset of the disease has been recorded as late as 81 years of age. Cranial nerve signs such as impairment of function of the external muscles, ptosis of one or both eyelids, difficulty in mastication, deglutition, and phonation may occur as manifestations of the disease. Ocular signs usually occur early in the disease and, if remission occurs, may be the last symptoms to disappear or may never do so. The onset of the disease usually is gradual but may be abrupt and fulminating.

Myasthenia gravis is attributable to disorders of the thymus gland, but despite extensive histopathologic studies of thymic tissue and endocrinologic studies, the pathogenesis of the disease is still rather ill defined.

Many theories as to the cause of this disease have been postulated and one of the most commonly accepted is that the thymus gland liberates a curare-like substance which interferes with transmission of nerve impulses across the myoneural junction of striated muscles. There is, no doubt, much research to be done before the relationship between myasthenia gravis and the thymus gland is fully understood. The only consistent histologic findings in thymus glands removed from patients with myasthenia gravis, and without demonstrable tumors, are the presence of lymphoid hyperplasia and the formation of germinal centers.

The response in suspected cases of myasthenia to a therapeutic test dose of neostigmine methylsulfate is usually quite dramatic and remarkable. The most effective medical treatment of myasthenia gravis is neostigmine administration either orally (neostigmine bromide) or by subcutaneous injection (neostigmine methylsulfate). The dosage of these preparations varies according to the severity of the symptoms and the individual response to treatment. Blalock[2] reports a case of a 14-year-old negro female who required as much as 910 mg. of neostigmine daily.

In the past few years thymectomy has been performed as a method of treatment of myasthenia gravis in cases with demonstrable thymic tumors as well as those without demonstrable tumors. From 1941 to 1944 Blalock[2] and his staff performed thymectomy on 20 patients. The age of this group ranged from 14 to 48 years—16 were females, 4 were males. Two of this group had thymic tumors and the remaining 18 presented the characteristic two-lobed gland which histologically displayed lymphoid hyperplasia and germinal center formation. Only those patients with the severe form of the disease who were disabled despite neostigmine therapy were subjected to thymectomy. The mortality rate of this series of cases was 20 per cent. The deaths resulting were all attributable to complicating respiratory infections. Of the 16 patients surviving, 3 had complete remission from symptoms.

In 1949 Keynes[3] presented a report of 155 patients with myasthenia treated by surgical removal of the thymus gland. His paper was primarily limited to discussion of 120 patients who presented no thymic tumor and survived operation; 79 showed a complete or almost complete remission of symptoms following surgery. His operative mortality was 4.2 per cent. Keynes concluded that the improvement resulting from thymectomy is directly influenced by the duration of the disease before thymectomy. The shorter the history of myasthenia gravis, the better the prognosis for remission of the disease.

Viets[4] disagrees with Keynes' assessment regarding duration of the disease and states that his patients with long histories have done fully as well following thymectomy as patients whose disease was of brief duration. Viets warns against "desperation" operation in severe cases of myasthenia gravis and states that patients responding to neostigmine and most over 40 years of age are included in those best treated medically.

CASE HISTORY

This history is that of a 28-year-old female admitted to the hospital on September 5, 1952, complaining of dysphagia which had become progressively worse during the preceding 2 weeks. The patient stated that a similar episode had occurred approximately 7 years previously but had disappeared. Whether or not this was a remission was not known.

The patient displayed difficulty in articulation and phonation, complained of diplopia, and manifested a right external strabismus, ptosis of both eyelids, and extreme weakness of her extremities. No sensory disturbances were found.

A 1-mg. therapeutic test dose of neostigmine methylsulfate was given and the patient experienced a marked increase in strength and muscle tone. Doses of 1 mg. were administered four times daily, and by the third hospital day the patient was able to swallow with much greater ease and was able to ambulate moderately. She was placed on oral Prostigmin bromide in doses of 15 mg. every 4 hours around the clock, but

while on the oral preparation she experienced exacerbation of symptoms.

The parenteral form was again given and increasing amounts of the drug were required until an average of 2 mg. intramuscularly was required every 2 hours around the clock. The patient also received atropine and ephedrine. Injections were given every 2 hours around the clock from October 15, 1952, until operation on March 20, 1953. During these months, at increasingly frequent intervals, she complained of substernal oppression, pain in the posterior cervical area and in the sternocleidomastoid muscles, dyspnea, and choking sensations, all of which made her very apprehensive.

Repeated x-rays of the chest as well as fluoroscopic examinations failed to demonstrate evidence of a thymic tumor. The complete blood chemistry was within normal limits, and the patient's erythrocyte count was consistently above 4,000,000, with consistent hemoglobin determinations. Since the patient's condition was static and in some respects worse, a decision was made to attempt a thymectomy.

Prior to the contemplated surgery the patient was observed closely and examined for any evidence of systemic infection, particular attention being paid to the respiratory system. She was placed on penicillin therapy prior to operation. Since myasthenic patients are very susceptible and intolerant to the mildest type of respiratory infection, it is imperative that they be protected from exposure even if it is necessary to follow isolation technic.

Adams[5] mentions that women with myasthenia gravis note an exacerbation of the disease just preceding their menstrual periods, and this was true of our patient. This fact was taken into account in planning the date for operation. Most myasthenic patients are thin, weak, and malnourished owing to disturbance of mastication and deglutition and other manifestations of the disease, and require quite extensive measures to improve their nutritional status before thymectomy. This patient, however, had managed to maintain a fairly good state of nutrition, and her weight remained fairly constant.

Various authorities advise that only moderate preoperative medication be given—usually morphine, 1/8 to 1/6 grain, with atropine, 1/150 grain—and advise against the use of barbiturates since these drugs, in practically all cases, cause severe depression of the myasthenic patient. Our patient was given 50 mg. of Demerol with atropine since it was known that she tolerated this drug well.

Anesthesia was induced with nitrous oxide, followed by intratracheal ether and oxygen. A peculiar but interesting fact noted during operation on patients with myasthenia gravis is the extremely small quantity of anesthetic required. During the 3 hours and 25 minutes she was anesthetized, our patient required only 50 cc. of ether.

The surgical approach was made through a sternum-splitting incision. The skin incision extended from a point just slightly above the suprasternal notch to the xiphoid process in the midline. The dense layer of pretracheal fascia which is attached to the posterior surface of the upper sternum must be cut to allow the operator's finger to be inserted behind the sternum to advance the soft tissues and to make an opening for the Lebsche sternal chisel. The sternum was split in the midline to the xiphoid process. Much oozing was encountered from the sternal marrow. A Finochietto-type of retaining retractor was used to spread the sternum and thus expose the anterior superior mediastinum. A small opening which was inadvertently made in the left pleura was repaired. The thymus gland was located and by blunt dissection isolated from the secondary tissues and the vessels were ligated. The gland was the shape of a distorted capital letter H and was grayish-pink in color. The anatomic structures lying deep to the gland were the left innominate vein, aortic arch, and pericardium. After removal of the gland the periosteum of the sternum and the deep fascia were reapproximated using interrupted silk sutures. The skin was reapproximated with interrupted vertical mattress sutures of 00 Dermalon. A tracheostomy was then performed. The total operative time was 3 hours and 5 minutes.

The postoperative progress of the patient was uneventful until approximately 72 hours following surgery at which time there was a rather sudden change in the character of respirations manifested by episodes of alternating shallow and deep respiratory excursions. The patient became apprehensive, and her lips and nail beds showed a suggestion of cyanosis. The patient was immediately placed in a stand-by Drinker-type respirator, which was kept ready in her room, and her condition became stabilized almost immediately. Prostigmin in doses of 2 mg. every 2 hours was continued while the patient was in the respirator until excessive mucous formation occurred in the respiratory passages. After having been in the respirator for 4 days the quantity of Prostigmin was gradually diminished, and by the twelfth respirator day all medication had been discontinued. The patient was removed from the respirator daily and the time out of the respirator was increased until she was completely removed on April 18, 1953.

The patient at present is receiving no medication, feels subjectively stronger, and shows definite improvement of the previously manifest weakness of the muscles of expression.

SUMMARY

1. The case history presented is one of myasthenia gravis which we believe has benefited from thymectomy. The patient, to date, has required no supplemental neostigmine.

2. It is generally agreed that thymectomy does not provide a surgical cure of myasthenia gravis in all cases, and it is impossible to determine which patients will benefit from the operation and which will not.

3. Thymectomy is indicated in any severe form of myasthenia gravis which appears progressive and in which the patient is disabled despite neostigmine therapy.

4. A high incidence of thymic abnormality has been found in myasthenic patients, but no causal relationship has yet been established.

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Abdominal Incisions

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The criteria for a satisfactory abdominal incision are: (1) adequate exposure, (2) conservation of the strength of the abdominal wall, (3) postoperative comfort, (4) ease of fashioning, (5) simplicity of closure, and (6) absence of unsightly scars. There has been sufficient proof in the past several years to support the contention that these criteria are better met by the employment of a transverse incision suitably placed than by any other method of performing a laparotomy when the surgery is above the umbilicus. When the surgery to be performed is best approached below the fold of Douglas, a paramedian rectus incision supports these criteria.

With the improved knowledge of surgical diagnosis, the surgeon now places the incision with the confidence that he has made a correct diagnosis and knows which portion of the abdomen must be exposed in order to carry out a definite procedure.

Recent advances in thoracic surgery and the advent of endotracheal anesthesia provide the surgeon with an additional incision which permits adequate exposure in upper abdominal surgery. These advances in thoracic surgery have also provided an incision which permits the general surgeon to open the chest wall with impunity in order to reach the heart when he finds cardiac resuscitation necessary.

In an article prepared for the meeting of the American College of Osteopathic Surgeons in October, 1948, entitled "The Relations of Anatomical Incisions and Their Closure to Early Ambulation,"[1] reference was made to work done with Richard R. Stuart, Ph.D., of the Department of Anatomy of the College of Osteopathic Physicians and Surgeons at Los Angeles. His report on the anatomy of the abdominal wall bears repetition at this time.

"*Anatomy of the Abdominal Wall.*—This area has been described so many times and in such detail that it seems hardly necessary to repeat such a description in its entirety. It does seem worthwhile, however, in this instance to revise some of the pertinent notions and, on the basis of observation in this laboratory, to add a point or two and to question some existing concepts.

"It is well known that the prevailing direction of the muscle fibers of the transversus abdominis muscle is in a transverse plane excepting for those fibers which take origin from the anterior superior iliac spine and from the inguinal ligament. These latter turn downward and tend to approximate the direction of the inguinal ligament.

"The prevailing direction of the muscle fibers of the internal oblique muscle is upward, forward, and medially, except for those fibers which arise from the neighborhood of the anterior superior iliac spine and from the inguinal ligament. These latter change direction gradually, turning downward also to approximate the direction of the inguinal ligament. The prevailing direction of the muscle fibers of the external oblique is downward, forward, and medially throughout.

"The fibers of the respective aponeuroses tend to continue the direction of the corresponding muscle fibers, blending in the midline to form the linea alba and even continuing to the opposite side.

"It is generally understood that the posterior portion of the rectus sheath extends from the fold of Douglas (i.e. about midway between the umbilicus and pubic symphysis) upward to the costal margin and consists of the aponeuroses of the transversus abdominis and the posterior lamina of the internal oblique. Likewise the anterior portion of the rectus sheath extends from the pubic symphysis upward as far as the insertion of the rectus abdominis to the thoracic cage and consists of (1) the aponeurosis of the external oblique, (2) the anterior lamina of the internal oblique (pubic to thorax), (3) the posterior lamina of the internal oblique (pubis to level of the fold of Douglas), and (4) the aponeurosis of transversus abdominis (pubis to level of fold of Douglas).

"Careful dissection in this laboratory tends to establish that the anterior lamina of the aponeuroses of the internal oblique does not always extend as high as the costal margin but frequently stops short by several inches. Above this level of the aponeurotic portion of the anterior layer of the rectus sheath consists entirely of the aponeurosis of the external oblique muscle.

"Not generally appreciated is the fact that in this upper portion the anterior layer of the rectus sheath is formed in part, and reinforced considerably, by a very tough deep fascia which blends with the aponeurosis of the external oblique over the rectus muscle but is easily separable from the muscle laterally, the greatest slope being in the lateral area while in the midline the fibers are more or less vertical, coinciding with the midvertical line. It should be pointed out that the prevailing directions of the fibers of this deep fascia correspond rather closely to that of the lines of Langer (lines of the attachment of the corium) across which the surgeon cuts only at the expense of a gaping wound and extensive scar formation later.

"A point sometimes overlooked by surgeons using the supra abdominal transverse incision is that the segmentally arranged intercostal nerves and vessels, in the plane between the internal oblique and the transversus abdominis, take an almost transverse direction in the anterior abdominal wall of the pyknic (short and stocky type) while they slope downward as well as medially in the asthenic (long and slender type). Obviously, the danger of cutting three or more nerves is much greater in the latter than in the former type."

Stuart also states that the prevailing direction of the lines of Langer usually parallels the lines of tension and compression of the skin in ordinary movements. From this it would seem probable that these lines serve also as an indication of direction of tension produced by all factors (e.g., bodily movements, gravity, etc.) upon the abdominal wall generally.

On the basis of Stuart's description of the anatomy of the anterior abdominal wall it would seem that the following conclusions can be drawn: (1) that the fascial strength of the anterior abdominal will is *greater posterior* to the rectus abdominis muscle from the fold of Douglas to the costal arch than it is anterior to the rectus abdominis muscle, and (2) the pull of the flat muscles of the abdomen laterally away from the midline is greater above the umbilicus than it is below the umbilicus since these muscles are intimately associated with respiration. Also it would seem that the anterior sheath of the rectus abdominis muscle is *more dense and fibrous below the fold of Douglas* and, therefore, has more tensile strength than does the transversalis fascia posterior to the rectus muscle below the fold of Douglas.

Further it has been observed that the strength of the rectus abdominis muscle is far greater and better developed below the umbilicus than above. This greater strength below the umbilicus partially offsets the degree of lateral pull by the flat muscles of the abdominal wall. The lessening of lateral pull makes closure of a vertical incision in the midline easier and reduces the likelihood of hernia below the umbilicus. In the light

of these observations the closure of the posterior sheath of the rectus above the umbilicus assumes the same importance as adequate closure of the anterior sheath of the rectus below the fold of Douglas, and there would be less probability of hernia following a midline or vertical incision below the fold of Douglas than there would be above it. Above the fold of Douglas the fibers of the transverse muscles are so well defined that an incision through the posterior sheath of the rectus and the peritoneum should be parallel to the lines of the fibers of this aponeurosis.

Generally the aponeurotic portion of the anterior sheath of the rectus above the umbilicus is likely to be delicate, but is reinforced by a well-developed deep fascia, according to Stuart's observation. The tension lines of Langer are predominantly in a transverse direction above the umbilicus and arch upward slightly. For this reason it is possible to divide the anterior rectus sheath above the umbilicus in a transverse direction and still follow the direction of the heaviest fibers.

Since the rectus muscle is attached at intervals to the anterior sheath by transverse tendons and since many of its fiber bundles are attached to the anterior sheath directly, thus preventing the muscle from retracting when transected, it need not be united separately when the abdominal wall is closed. The closure of the anterior sheath of the rectus approximates the cut edge of the muscles.

Now it can be said safely that the anatomic incision for surgery above the umbilicus is a transverse incision which divides the anterior sheath of the rectus transversely, the division of one or both of the rectus abdominis muscles, and the division of the transversalis muscle and fascia parallel with its fibers. Further, it should be stated that a transverse incision for upper abdominal surgery should not be made more than an inch above the umbilicus, except in the case where a transverse abdominothoracic incision is to be used. If the incision is made higher than this point the extension of the incision into either loin is not possible because the incision runs into the costal arch, thereby limiting the extent to which the incision can be enlarged.

The development of the thoracoabdominal incision in recent years can be considered a milestone in the progress of surgery. Due to notable advances in anesthesia and blood replacement therapy in recent years, this precise technic has developed to a point where it has become an integral part of the surgeon's armamentarium. In the field of general surgery, esophageal resection, total gastrectomy, and splenectomy have become commonplace as the result of the unparalleled exposure secured through this incision. Lesions which heretofore would have been considered inoperable have proved amenable to surgery when approached in this manner.

Anatomically one must agree that the supraumbilical transverse incision is the incision of choice if the incision is not placed over 2 cm. above the umbilicus, since this incision can be extended laterally across either or both of the rectus muscles without limitation of the incision by the costal arch. On the other hand, this incision in actual practice does not give adequate exposure for upper abdominal surgery unless the incision is extended vertically in high gastric resections or surgery upon the bile ducts. This is especially true in the asthenic type of individual where the costal arch oftentimes extends down at an acute angle from the midline. The incision gives better exposure in the pyknic or stout type of individual where the costal arch tends to run more transversely across the upper abdomen. In practice one finds himself going back to the paramedian incision extending either from the ensiform cartilage down to the left of the umbilicus for gastric surgery or from the ensiform cartilage down to the right of the umbilicus for gallbladder surgery, realizing full well when he cuts across the fibers of the fascia on the posterior surface of the rectus muscle that he is asking for trouble in closing the abdomen.

With the advent of thoracic surgery under endotracheal anesthesia the objections to the upper abdominal transverse incisions have been overcome. The transverse incision can now be placed higher on the abdomen so that the ends of the incision extend from the costal cartilage at the end of the eighth interspace on either side. In the event the incision needs to be enlarged because of inadequate exposure, it can be extended by cutting across the costal cartilage and continuing the incision into the eighth interspace to the angle of the rib. The diaphragm is divided in line with its fibers, thus producing a pneumothorax. The rib separator is placed between the eighth and ninth ribs giving adequate exposure to the entire upper abdomen and all the organs contained therein.

The main objection to this incision, made by those who have had the most experience with it, is that the morbidity is somewhat greater than with other types of abdominal incision which do not include opening of the thorax. In addition to closing the thoracic cavity following such an incision it is necessary to drill two holes in either side of the cut costal cartilage and approximate the sides with wire suture. In the majority of cases of upper abdominal surgery the transverse incision, cutting across both upper rectus muscles, and a transverse incision through the posterior sheath of the rectus gives adequate exposure. In the event such an incision does not give adequate exposure the surgeon has ample time to request the passage of an endotracheal tube which will permit opening the thorax and thereby giving adequate exposure for any upper abdominal surgical procedure.

We all realize that habit plays an important part in surgery and that it will be difficult for many surgeons to change from an upper right or left rectus incision when doing upper abdominal surgery, even though it is in violation of every anatomic principle. It is doubtful that the transverse abdominal thoracic incision will come into wide use until by experience general surgeons learn of the advantages of this exposure in carrying out difficult upper abdominal surgical procedures.

The transverse incision for an appendectomy, in my opinion, is the method of choice as opposed to the classical McBurney muscle-splitting incision, although transverse incisions in the lower abdomen should be reserved for male patients in whom a definite diagnosis of appendicitis has been established. A transverse incision in the skin and the division of the aponeurosis of the external oblique in line with the fibers of that muscle can be carried to the lateral border of the rectus abdominis muscle. From that point the incision can be transverse across the fascia of the rectus muscle and extended in line with the fibers of the fleshy portion of the internal oblique muscle. No attempt is made to separate the rectus muscle from its anterior sheath; however, the muscle is separated from its posterior sheath as far as the midline if necessary to obtain sufficient opening by retracting muscle medially; the posterior sheath is then opened transversely.

In the event the operative procedure cannot be carried out with retraction of the right rectus muscle toward the midline the muscle can be divided across its fibers to a point which will permit the operator to have sufficient exposure, if the muscle has not been separated from the anterior rectus fascia. There is no reason why the rectus muscle should be approximated with sutures when the abdomen is closed since the rectus is adherent to its anterior sheath and will be approximated by contraction because of the adherence of the fibers of the muscle to the fascia on the anterior surface. Only rarely it is necessary to divide the rectus muscle completely in order to gain adequate exposure in operating upon an appendix in the male.

It is extremely important in closing this type of incision that the anterior leaf of the internal oblique, which is reflected for a distance of approximately ½ to ¾ of an inch on the anterior surface of the rectus muscle, be approximated as well as the anterior leaf of the external oblique. It is true in making a transverse incision of the rectus muscle that at least one of the intercostal nerves is divided, but this division is not sufficient to create any weakening of the anterior abdominal wall, to paralyze the rectus muscle, or to interfere with proper healing.

Although a gridiron incision has been used in operating for appendicitis in the female, its use is considered inadvisable because of the desirability of examining the pelvic organs at the time of the appendectomy. Therefore, in operating upon females, a right rectus incision is the incision of choice whether the operation is for surgery of the female pelvic organs or the removal of the appendix.

Abdominal incisions in obese patients constitute a problem which has received far too little consideration, for, in my judgment, improper incisions are the cause of the majority of wound hernias following abdominal surgery. When a vertical incision is made in an obese abdomen, the fatty pad is often 6 to 8 inches thick. When the subcutaneous fat has been incised the wound gapes open as the fat falls to either side. The weight of this fat is of tremendous importance when it comes to closing the fascia; the lateral pull of the fat on the incision in the fascia is a matter which is seldom considered; but, in my judgment, it accounts for the failure of the edges of the fascia to unite regardless of the type of suture material used.

In making a transverse incision in the obese abdomen it is necessary to retract the fat from the line of incision in order to approach the deep fascia, and there is no lateral pull of the fat away from the vertical incision in the fascia. If necessary the fat can be dissected away from the anterior sheath of the rectus far enough to permit a liberal vertical incision in the fascia below the umbilicus. When the incision is fashioned in this manner it is obvious that there is far less likelihood of an incisional hernia than if the skin and fat were incised vertically.

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Clinical Diagnosis in Thoracic Surgery*

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Thoracic surgery rarely necessitates emergency measures except in cases of trauma or massive uncontrolled hemorrhage. For the most part, thoracic surgery may be classified as elective. Therefore, time is available for careful evaluation, not only of the patient's immediate illness but also of any other condition which may complicate postoperative recovery.

The etiology of thoracic surgical conditions, for purposes of description, may be divided into four categories: (1) congenital lesions, which I shall not discuss in this paper, (2) injuries, (3) inflammatory lesions, and (4) neoplastic diseases.

INJURIES

In the treatment of corrosive stricture of the esophagus which fails to respond to dilatation by esophagoscopy or string dilators or both, reestablishment of the continuity of the gastrointestinal tract can be accomplished surgically.[1,2] With this operation, the patient will not actually starve to death or become a chronic invalid as the result of a gastrostomy tube. If esophagectomy is anticipated, whether the cause is a corrosive agent or a neoplasm, an opinion should be obtained on the status of the trachea and left main bronchus, particularly if neoplasm is the etiologic factor.

The improvement which results from surgical intervention in certain lung disturbances can be more than impressive. As the result of traumatic hemothorax with resultant pleural fibrosis, it is my understanding that the pulmonary volume is reduced, and the encased or imprisoned lung is limited in participation in the act of breathing. The lung takes up less oxygen than it should, and the pulmonary arterial system responds by diminishing the blood flow through the lung in its attempt to prevent hypoxia. As the result of the organization of blood and fluid in the pleural space, a nonexpansile membrane is formed. At Fitzsimons Hospital,[3] nineteen unselected cases were studied before and after decortication in regard to their pulmonary function. Uniform improvement was found in the percentage of ventilation, in oxygen consumption, in vital capacity, and in maximal breathing capacity with the eventual restoration of normal function. Although I have no reliable means of measuring the development of pulmonary insufficiency, my experience has seemed comparable to that at the Fitzsimons Hospital.

If the temperature remains elevated in chronic empyema, in spite of adequate osteopathic management, and fluid continues to accumulate, the lung is prevented from re-expanding and surgical intervention is instituted. On the other hand, if the temperature and pulse rate improve, but fluid continues to collect, surgical intervention again is recommended—this time, pleurectomy.

If, in cases of chronic empyema, after rib resection and tube drainage, the temperature and pulse rate return to normal but the lung still does not re-expand,

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it is suggested that decortication be performed within a few weeks rather than waiting for months as was done in the past.

In summary, a few of the common indications for decortication[4,5] are unexpandable pneumothorax, pleural fluid, empyema, obliteration of the pleural space by extreme shifting of the mediastinum and overexpansion of the opposite lung.

INFLAMMATORY LESIONS

Pulmonary Abscess.—[6]

A former viewpoint, still adhered to by some, that the lower lobe is the most common site for abscess formation seems to require modification. It has been my experience that the upper lobe is the common site for abscess formation. In fact, in ten cases this past year, the lower lobe (right) was invaded only twice. A situation which I encountered which would seem to refute another popular belief is that less than half of these cases offered the symptom of sudden expectoration of a large amount of putrid sputum.

Clinical diagnosis is difficult at times when the history does not bear out the complaint of putrid sputum. It becomes doubly difficult when the history does not record a recent tonsillectomy, a none-too-recent deep anesthetic, or coma, whether from alcohol or drugs. For the diagnostician another disappointing finding, radiographically, is that only about half of lung abscesses show convincing evidence of cavitation.

Before a cavity has made its appearance in lung abscesses, bronchoscopy[7] combined with antibiotic therapy offers only fairly good results. In the late cases, bronchoscopy has not helped the abscess per se, but it has aided in improving the patient's general condition. The late cases in my series did not respond to antibiotics, and, therefore, I am of the opinion that antibiotics should not be employed except in preparation for surgery.

Late cases[8] may be defined as those which have a large or poorly drained cavity or an atelectatic or fibrous reaction around the wall of the cavity. They are definitely in need of surgical therapy. A late case[8] is also one which may be complicated by daughter cavities even though, in terms of time, it may be found within a few weeks from the onset. Nye[9] offers one other indication for surgical management of a lung abscess—when the abscess remains unchanged on roentgenograms for 2 or 3 weeks, even if there has been amelioration of symptoms.

Tuberculosis.—Overholt[10] and Dolley[11] give the following indications for resection in pulmonary tuberculosis: (1) associated suppuration, (2) failure of thoracoplasty, (3) predicted thoracoplasty failure, (4) preservation of function, and (5) selection as the operation of choice.

Nine of ten cases which I recently treated had as their indication for resection, predicted thoracoplasty failure. This term includes those cases in which thoracoplasty is either contraindicated or offers less chance of control of the disease than resection. Such conditions include tuberculoma, associated suppuration, high-grade bronchial stenosis, cavities distributed in both upper and basal portions of the lungs, basal disease, and giant cavities. Of the ten resections, there have been no deaths, and 80 per cent have remained negative.

NEOPLASTIC DISEASES

Only 30 to 35 per cent[12-15] of cases of lung neoplasm are actually resectable, and one-half of these resections are classified as palliative rather than curative because of the extent of the lesion. Therefore, it is imperative that diagnosis and evaluation of lung tumor be offered at the earliest possible date.

Irrespective of whether clinical symptoms are present, bronchoscopy[16-18] should be performed to obtain tissue for biopsy and to rule out involvement of the main bronchus in its proximal portion. Further examination should evaluate any indirect evidence of mediastinal involvement such as compression or fixation of the lower trachea or main bronchus, widening or fixation of the carina, and/or paralysis of one vocal cord. A positive finding is of great significance, but a negative finding in bronchoscopy or failure to find malignancy in either a biopsy or in bronchial secretions does not rule out the possibility of carcinoma. In some suspicious cases, repeated bronchoscopic examinations are indicated in an attempt to obtain cytologic confirmation.[19]

I feel that the contraindications for resection of lung tumors are actually more important to the surgeon than the indications. The contraindications are paralysis of a vocal cord, particularly the left, any disturbance in the contour of the trachea, widening of the angle of bifurcation of the trachea, interference with free movement of the carina, encroachment of any of the bronchial subdivisions and deformity, fixity, or rigidity of the main bronchi, evidence of metastasis or bones or remote organs, and pleural fluid.

Lung tumors are enigmatic lesions with puzzling behavior. Frequently it is necessary for those faced with a questionable diagnosis, particularly for those who demand absolute proof of the presence of the lesion, to ask the question, "Will my patient pay with his life if I advise a wait-and-see policy?" This is one time I do not advise hesitation—it's later than you think!

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The Causes of Bleeding During Pregnancy

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The purpose of presenting this paper to surgeons is to recall some of the reasons for bleeding in pregnancy and to review the factors behind this occurrence which to your pregnant patient is a prime disaster. Many approach the situation with a lessened regard for its cause and a sharpened interest in its treatment. Of course, we are chiefly concerned with treatment, but it is certain that a more astute recognition of the underlying cause may do much to facilitate the efficiency of treatment.

When a woman presents herself with symptoms of abnormal bleeding the first search must be, if she is in the reproductive age, for symptoms and signs of pregnancy. Many women who become alarmed by what they believe to be an abnormal menstrual cycle in reality may be suffering an abortion early in the first trimester of pregnancy. History, symptomatic diagnosis, and the various biologic tests for pregnancy should be used to eliminate this possibility.

Cervical Erosion and Cervical Polyps.—

In early pregnancy, and indeed sometimes in late pregnancy, bleeding may be either incidental to or caused by the reproductive factor. Cervical erosion is one of the conditions incidental to pregnancy which ordinarily do not cause abortion. Cervical erosions can and do bleed during pregnancy, especially in the early stages when a congestive increase in circulation occurs in the cervix. Many patients with vaginal bleeding in the first trimester have been unnecessarily incapacitated because of failure to recognize this simple cause.

Cervical polyps bleed as easily during pregnancy as otherwise but are often overlooked as a cause of bleeding in the pregnant patient. How much simpler treatment might be if the physician remembered these two causes of bleeding and examined the patient to see if they exist. How often has a pregnant woman, without examination, had prescribed bed rest, progesterone, sedatives, and other treatment without first eliminating either of these causes? How many families have been caused serious emotional stress, financial burden, and unnecessary fear because a physician failed to diagnose either of these conditions which ordinarily will not cause abortion?

Fibroid and Cancer.—

More serious disorders which result in bleeding incidental to pregnancy are fibroids and cancer. The fibroid causing bleeding is usually of the submucous variety. It may be accompanied by larger intramural growths which often confuse the examiner as to the exact size of the uterus and the exact stage of the pregnancy. I know of no accurate method of determining whether the fibroids are bleeding in the presence of an undisturbed pregnancy or are the cause of abortion. However, knowledge of their presence and a careful evaluation of their effect results in skillful avoidance of difficulty if they are bleeding in the presence of an undisturbed pregnancy. If they appear to be causing abortion, considerate evaluation of the progress and of the necessity for interference is the procedure. Many pregnancies in the presence of fibroids and bleeding have been successfully concluded at term.

Cancer of the cervix may be present in pregnancy although, fortunately, rarely. It is easy to overlook it entirely, and only careful examination will reveal it in its beginning stages. Any suspicion of cervical carcinoma warrants a Papanicolaou smear test and/or biopsy. Both these procedures can be done without endangering the patient or causing abortion. Finding one positive reaction makes the performance of many negative tests worth while.

Endocrine Disturbances.—It is well established, although not completely understood, that endocrine disturbances may cause bleeding during pregnancy. Perhaps chief among these is thyroid imbalance. It should be noted that disturbance of the thyroid may cause habitual abortion, and such a history should lead the physician to suspect this gland and eliminate any pathologic condition which might cause abortion.

Ovum Abnormalities.—Abnormalities of the ovum may be responsible for uterine bleeding early in pregnancy. Some research has been done to point out that delays in fertilization of the ovum may result in abnormal implantation and resulting physiologic deficiency which ends in hemorrhage very early in pregnancy. Such hemorrhage may very easily be misinterpreted as being a normal menstrual cycle.

Pelvic Conditions.—

Structural and circulatory deficiencies of the pelvic viscera may be a factor. Severe incarcerated retroversion or prolapse with resultant congestive abnormality may cause endometrial bleeding and eventual abortion. Awareness of these structural defects, concern for them, and proper management form a prophylactic program which may prevent abortion.

Naturally, any pelvic inflammatory disease during pregnancy may be a factor in abortion. Endometritis may result in a diseased placental structure; oophoritis and salpingitis may result in bleeding and abortion.

Criminal Abortion.—It is estimated that 25 per cent of all abortions are criminal, and criminal abortion must not be overlooked as a possible cause of bleeding in the early or even in the late months of pregnancy. Isolating instrumental interference as a cause may considerably increase the efficiency of the treatment instituted.

Syphilis.—Syphilis may cause bleeding and abortion either early in pregnancy or, more frequently, in the second trimester. Early syphilis is more likely to do damage when coincident with pregnancy. The pathologic mechanism in syphilis is the avascularity of the developing chorionic villi.

Rh Factor.—The Rh factor infrequently plays a part in causing bleeding and abortion. In about 13 per cent of all marriages the husband's blood is Rh positive while the wife's is Rh negative. In about 10 per cent of all births the mother's blood is Rh negative and the infant's Rh positive. It is true that in only a small number of these, probably 1 in 25, will abnormality result, but the possibility must, nevertheless, be considered.[1]

Hydatid Mole.—In the early months of pregnancy intermittent hemorrhages may result from that obstetric oddity, hydatid mole. The pathologic picture is typical and the grapelike bunches of dropsical degeneration of

chorionic villi once seen are unmistakable. The condition is believed to derive from a pathologic ovum. Usually there is no evidence of a fetus.[1] Early diagnosis of this cause of bleeding is a lifesaving procedure.

Ectopic Pregnancy.—Ectopic pregnancy, tubal, ovarian, or abdominal, may cause abnormal bleeding. Bleeding may be external in the form of spotting or internal due to rupture of the ectopic formation and hemorrhage into the abdominal cavity. It is extremely difficult to diagnose an ectopic gestation before its rupture, but it must be constantly remembered as a cause of antepartum bleeding. Particular attention must be given to those instances in which rupture has occurred intra-abdominally and bleeding has then limited itself because of quick coagulation and localized pressure hemostasis. Bleeding irregularities will then occur which are most difficult to diagnose.

Anticoagulants.—A very rare cause of bleeding is the use of anticoagulants for a disease process coexisting with pregnancy. Recent reports[2] indicate this as a cause in several cases.

Placenta Praevia.—

One of the two main causes of antepartum bleeding is placenta praevia. This condition occurs chiefly in the last trimester of pregnancy.

The development of the placenta, in part or in its entirety within the zone of dilatation of the uterus, presents one of the most dramatic hazards of the last trimester of pregnancy. Why does it occur? Much has been written concerning the causes of this condition; outstanding are endometritis and multiparity. The multiparous woman is naturally subject, because of her exposure to infections, operations, abortions, or puerperiums, to a greater incidence of endometrial inflammation than is the primipara. Statistics vary, but authorities believe the incidence to be from six to thirty times greater in multiparas than in primiparas.

In placenta praevia the rather thin, greatly enlarged placenta indicates, doubtlessly, nature's efforts to obtain adequate blood supply for the growing embryo. If the nutritional power of the supporting organ is not great, the chorionic villi hypertrophy and spread to receive adequate nutrition. The high percentage of placenta praevia at the birth of twins and the increased size of the placenta in multiparous women would seem to give credence to this statement.

Mechanical factors cause the greater part of the hemorrhage associated with this condition. In the latter weeks of pregnancy, the lower uterine segment becomes thinned out and the cervix becomes effaced and dilated to some degree. As a result of this stretching mechanism, the placenta is partially torn from its attachments with resulting hemorrhage. Other mechanical factors include unwarranted, repeated, or vigorous pelvic or rectal examinations and coitus.

It has been noted that toxemia is present in many cases of placenta praevia, and a close observation of patients with the toxic symptoms of high blood pressure and albuminuria may reveal this phenomenon and forewarn the physician.

Abruptio Placentae.—

The other most important cause of antepartum bleeding, which also usually occurs in the third trimester, is abruptio placentae. In abruptio placentae or accidental hemorrhage, bleeding arises from premature detachment of the placenta from its normal position in the upper uterine segment.[6-9] The causes for this abnormality may be nontoxic or toxic. Nontoxic factors are trauma, excessive intrauterine pressure as in polyhydramnios or multiple pregnancies, and abnormalities of placental development. It is obvious that trauma or great distention of the uterus in polyhydramnios or multiple pregnancies may mechanically loosen a placental attachment and cause hemorrhage. Degenerative changes in placenta or placental site may also result in disruption of this attachment.

In abruptio placentae caused by toxic manifestations, the pathologic condition is primarily that of an acute degenerative arteriolitis which leads to necrosis of the decidua beneath the placenta. Hemorrhage follows.

An even more serious type of abruptio placenta is the so-called Couvelaire uterus, or uteroplacentae apoplexy, which results in intrauterine hemorrhages which decrease and destroy the efficiency of the placental attachment.

Differences in the type of hemorrhage in placenta praevia and abruptio placentae should be kept in mind to aid in differentiation. The hemorrhage of placenta praevia is silent, external, painless, and often multiple. The first hemorrhage is usually mild, and the next progressively more severe. The signs are those of anemia in its various stages. In abruptio placentae the course is stormy. Hemorrhage is both internal and external and is accompanied by severe uterine pain. Hemorrhage is single, and signs of anemia are more serious than the external blood loss would indicate. In about half the cases toxemia will be evident. The uterus is tender; the fetus may be dead.

CONCLUSIONS

Bleeding in pregnancy is a prime disaster and leads the list as a cause of death. Whether the hemorrhage merely inconveniences the patient or whether it endangers her life, it deserves careful, cautious, accurate investigation to determine its cause.

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Evaluation of Surgery for Peptic Ulcer

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There are two main long-range complications of gastric surgery for peptic ulcer. They are the so-called dumping syndrome and gastrojejunal ulceration. A third complication, but of minor importance, is failure to gain weight and associated disturbances of bowel function. No mention will be made of immediate postoperative complications such as fistulas or hemorrhage.

The three surgical approaches to peptic ulcer are: (1) partial or subtotal gastrectomy, (2) vagotomy with or without gastroenterostomy or gastrectomy, and (3) gastroenterostomy. In addition to discussing peptic ulcer and its management and complications, I will make a comparison of the percentages of occurrence of complications in the surgical procedures mentioned above. I will suggest methods for prevention of these complications and mention treatments, if complications should arise.

In the space allotted to this subject, it is impossible to go into the indications for gastric surgery. All the figures given and conclusions made are of course predicated on the assumption that the patient is well prepared for surgery. It should not be necessary to emphasize that gastric surgery requires the most meticulous preoperative preparation, special care being devoted to electrolyte and fluid balance. No further mention will be made of this important aspect.

Emphasis will be placed on evaluation of the various methods of gastric resection, since, statistically, these procedures have much better long-range results and fewer proved complications than either vagotomy or gastroenterostomy. Some comparison will be made between the Billroth I type of gastrectomy and some of the modifications of the Billroth II.

There are fewer indications for gastroenterostomy than for either of the other two procedures although gastroenterostomy still has a definite place in the treatment of the peptic ulcer patient. It has proved to be a procedure which can be safely carried out, particularly on the bad risk patient. The main complication of gastroenterostomy is stomal ulcer which occurs in approximately 20 to 25 per cent of cases. However, gastroenterostomy may be carried out safely without too much fear of this complication in the older individual who has a low gastric acidity and considerable pyloric obstruction. In the debilitated patient with gastric obstruction, gastroenterostomy may be indicated as a temporary procedure, thus allowing the patient to improve sufficiently so that a gastric resection may be undertaken more safely at a later date. Therefore, in most instances, gastroenterostomy should be considered as a compromise procedure.

The procedure of vagotomy alone enjoyed some popularity a few years ago. Later gastroenterostomy was performed in addition to vagotomy because the vagus resection caused a spasm of the pylorus and gastric retention due to gastric atony. After years of experimentation and clinical research the results were improved but they could not compare with those of partial gastrectomy. Therefore, for the most part vagotomy has been eliminated from the surgical treatment of peptic ulcer.

In view of the present knowledge of gastric surgery, recurrent stomal ulcer following conventional gastric resection or gastroenterostomy for the bad risk patient appears to be the indication for vagotomy.[1-3] Vagotomy has been advocated by several authors in addition to either hemigastrectomy or the conventional three-fourths or four-fifths partial gastrectomy. It has been the conclusion of other authors[4-6] that this is of no value. Still others[7] believe that the addition of vagotomy to conventional gastrectomy is definitely harmful and that the increase in postoperative complications does not warrant such a procedure. Therefore, it is my conclusion that nothing is to be gained by the addition of subdiaphragmatic vagotomy to a well-performed gastric resection. In my opinion it should not be done. Vagotomy, then, is reserved for recurrent ulcer following a well-performed gastric resection. This should be attempted before converting a subtotal into a total gastric resection.

There are two general methods for re-establishment of gastrointestinal continuity after resection of the distal portion of the stomach. These are the Billroth I operation and its modifications in which the stomach stump is anastomosed to the duodenum, and the other is the Billroth II operation or any of its modifications in which the gastric stump is anastomosed to some portion of the jejunum. At the present time the great percentage of modern surgeons prefer the Billroth II type of gastric resection.[8] However, more and more articles have appeared recently which advocate the Billroth I. These will be discussed later along with their advantages.

After perusing the literature[8-14] it appears that approximately 90 to 95 per cent of gastrectomy patients should be well pleased or at least have a satisfactory result. The so-called dumping syndrome should not appear in more than 2 to 5 per cent.[15-17] The chief cause of operative failure in gastrectomy is the sequel of jejunal or stomal ulceration. This complication should not be over approximately 3 per cent.[17,18] The dumping syndrome occurs earlier and perhaps more often than anastomotic ulcer, but for the most part this can be controlled if certain regimens are outlined for the patient. It is important to remember in evaluating results regarding anastomotic ulceration that, while the dumping syndrome occurs early, ulcer can delay in its occurrence as long as 25 years.[12] Therefore, it is obvious that a long follow-up is necessary for accurate evaluation.

Nearly all modern clinicians accept the idea that the most important factor in the occurrence of jejunal ulcer is the impingement of gastric juice on a relatively unprotected jejunal mucosa. Achlorydria is not essential in obtaining a satisfactory result, though it must be noted that in none of the cases of proved marginal ulceration does achlorhydria exist.[8] There has been experimental evidence to show that the more distal mucosal portion of the jejunum has less resistance to the effects of acid peptic mixture. A factor in this resistance may be that the shorter the proximal loop, the greater is the concentration of alkaline bile and pancreatic juices to bathe and protect the anastomosis. This is the reason Wangensteen[19] has been quite adamant in recommending a short jejunal loop. On the clinical side, however, the evidence is somewhat con-

flicting as to whether or not a short loop anastomosis is important in the prevention of jejunal ulcer after gastric resection. The amount of stomach removed is the more important factor. It is the conclusion that at least 75 to 80 per cent of the stomach should be removed, thereby removing not only the bulk of the ulcer-bearing organ and its secreting glands of the corpus but also the pyloric antrum. It is important to remove the pyloric antrum because this area of the gastric mucosa has the capacity to elaborate a substance (gastrin) as the result of ingestion of food. Gastrin is absorbed into the blood stream and reaches the parietal cells and stimulates them to secrete hydrochloric acid.[10,12]

Several authors[8,16] recommend a long anterior jejunal loop because of the greater ease of technical performance of the anastomosis and if jejunal ulcer occurs, surgical correction is much easier. However, if, as Wangensteen[19] believes, the incidence of jejunal ulcer after the short loop anastomosis can be reduced to an almost negligible amount, then these arguments for a long loop anterior anastomosis are not justified. The evidence then suggests that the shorter the jejunal loop the less is the possibility of recurrent ulcer.

The size of the opening seems to be another factor of importance. Mann and his associates[20] suggested the mechanical or "jet effect" of a small stoma as a causative mechanism in the occurrence of jejunal ulcers. The acid contents of the stomach are suddenly expelled into the jejunum through a small anastomotic opening onto a less acid-resistant jejunal mucosa. A definite factor in the prevention of stomal ulcers is the reflux of the alkaline duodenal bile and pancreatic juice into the stomach for dilution of the gastric acidity. Therefore the larger the stomal opening, theoretically the greater should be the mixture of stomach and duodenal contents occurring, thereby exposing the nonacid-resistant jejunal mucosa to a more neutralized gastric mixture. A large opening, however, makes the patient much more prone to the dumping syndrome. This will be discussed later. I have performed stomach surgery on the theory that the opening into the jejunum need be no larger than the size of the lumen of the jejunum. I feel that the stomach opening should not allow any more food to pass along than the lumen of the jejunum can accept without undue distention. I have found, as has Smith,[16] that a gastrojejunal anastomosis approximately 2½ cm. in diameter has caused the least distention.

The so-called dumping syndrome is another important complication of gastric surgery. A better name for this might be the early postgastrectomy syndrome. Fortunately, most of the cases are preventable, and if it should occur to a mild or severe degree, most of them can be controlled without further surgery. There are several theories pertaining to the etiology of the postgastrectomy syndrome, all of which have good evidence to support them, but none of which has any real proof.[10-17,21-26] The symptoms of early postgastrectomy syndrome are most commonly epigastric distress or fullness, weakness, vertigo, and sweating in the order mentioned. There are all degrees of severity of this syndrome and, according to these authorities, the occurrence varies from 0 to 75 per cent. In my cases I believe the rate is between 3 and 5 per cent, and that this is considered about normal.

Sudden distention of the jejunum with a bulky meal is recognized by most authors as the immediate cause of early postgastrectomy syndrome. Others question this physiology. It has been hypothesized[10] that the mechanism producing the symptoms of this syndrome is jejunal distention due to an outpouring of fluid by the jejunal wall in an attempt to dilute hypertonic fluid material which has been passed into the jejunum by a rapidly emptying stomach. It has also been observed that these symptoms may fail to occur if the energy expended by the jejunal diluting mechanism is dissipated by production of an excessive hyperactive peristalsis. The meal is then dispersed rapidly throughout the small intestine, sometimes with resultant diarrhea. Patients who complain of a loose bowel movement 10 to 30 minutes following meals do not as a rule have dumping symptoms.[10] It has been noted[8,16,17,23,25] that the foods most commonly associated with production of these symptoms are those of high osmotic potentials such as free sugar, ice cream, and cake with icing, especially when taken with liquids. Apparently the intake of liquids adds to the bulk, and thereby increases the dumping syndrome. These symptoms may be avoided in many patients by the simple expedient of having them avoid excessive liquids with their meals. Some patients have observed that an extra tablespoonful of food will bring on symptoms of epigastric fullness or fainting. It may be their own natural regulation of the amount of food ingested which is the reason so many of these people fail to gain weight.

Several observers[15] noticed that if patients lay down just before eating, they could take a greater quantity of food without developing postgastrectomy distress. The same effect was noted if the patient vomited just prior to eating. They furthered their experiments with a mercury-filled bag in the afferent jejunal loop and found the same symptoms were produced. This seemed to indicate that if the afferent loop could be emptied just before a meal, the chances of the early syndrome occurring were very much reduced and as a consequence a larger meal could be taken. In the erect position the afferent loop was loaded with bile and pancreatic secretions and there seemed to be a kinking at the upper angle where it joined the lesser curvature of the stomach. This impeded the free emptying of the afferent loop. It seemed that the actual weight of the afferent loop was a factor in producing the early syndrome and when the stomach was filled with food this further added to the kinking. Occasionally the writer[15] found that it was the afferent loop which was dilated. This was especially true where there was a short loop with a retrocolic anastomosis and when the patient lay down, the kinking effect was reduced and the loop emptied itself. They further concluded then, that if the heavy filled afferent loop plus the weight of food brought on the attack, a more adequate support of the afferent loop might be an answer to preventing or reducing early postgastrectomy syndrome. This was effected by bringing up the afferent loop and suturing it to the rim of the peritoneum at the upper edge of the lesser omentum and left gastric artery stump. As a result Capper and Butler[15] have advocated, in correction of the severe early postgastrectomy syndrome, merely tacking the afferent loop up so that it may drain properly. Nothing more is done. The operation is undertaken if the symptoms can be brought on with a mercury-filled bag in the afferent loop. At the time of their writing, eight cases had been so treated and seven were cured. This seems to me a quite logical explanation and I have been making a concerted effort to see

that the afferent loop hangs in such a manner that it may empty without difficulty.

There are a few patients who develop vertigo and other vasomotor symptoms 2 or 3 hours after meals. This group of symptoms is termed the late postgastrectomy syndrome[15,23] and seems to be a disturbance of the carbohydrate metabolism in which the glucose-regulating mechanism of the duodenum has been disturbed. Serial blood sugar determinations were made after meals and it was found that there was a sharp hyperglycemic rise followed by a rather sharp drop approaching hypoglycemic levels. The treatment of late postgastrectomy syndrome on this basis, then, is more food, rather than a limitation of food as in the early syndrome. Tanner[27] suggested that the term "dumping syndrome" be dropped since there is no direct evidence indicating that this is the cause of the syndrome. Rather than the usual small meal regimen, he suggested that the patient take bulky meals of fat and protein three times a day and that he eat until he feels bloated at each meal. He believes that by this means many patients increase their meal capacity in spite of discomfort for a few weeks. In his opinion, frequent small meals prolong disability in this problem.

It might be well to mention retrocolic short loop gastrectomy. The shortest possible loop of the jejunum can be used in this type of gastrectomy. If the recommendation for the short jejunal loop is correct, then a no-loop or short-loop retrocolic gastric resection would be ideal. However, it has several drawbacks: (1) There is danger of disturbing the blood supply of the transverse colon; (2) there is some distortion of the suture line in the obese patient; and (3) difficulty is encountered if further surgery is required.

Many authors[28-31] favor gastroduodenostomy or a Billroth I type of gastrectomy. They state that it has certain advantages in that it is more anatomic, that is, the stomach acid is poured into the duodenum which is more prepared for receiving it than is the jejunum. Some claim it is technically easier to perform since it is carried out in the supracolic compartment. There is no disturbance of the transverse colon, and the duodenal stump is more secure since there is no back pressure possible in this area. However, many objections have been raised to this technic,[15] namely, that it is technically more difficult than a gastrojejunostomy, that insufficient stomach is resected, that the reflux beneficial alkaline duodenal contents are less than after a gastrojejunostomy, and that complete mobilization of the duodenum has a tendency to create duodenal ileus. The objection that too little stomach is removed can be answered if the decision to perform a gastroduodenostomy is left until after the desired amount of stomach is removed. Then the decision can be made as to whether the stomach can be brought down to the duodenum without tension. It is only simple logic that in a given case with a badly scarred duodenum from previous perforation, this operation is not practical. Therefore, it is my conclusion that the Billroth I type of operation might have slightly fewer dumping symptoms, but otherwise it has no particular advantages and may be reserved for certain cases of gastric ulceration.

SUMMARY AND CONCLUSIONS

1. A 75 to 80 per cent gastric resection should be performed, removing essentially all of the lesser curvature and at least three-fifths of the greater curvature.

2. All of the pyloric antrum and pylorus and a small ring of duodenum should be resected.

3. The choice of the shortest afferent loop practical to use in each individual case is recommended.

4. The afferent loop should be adequately supported to the peritoneal fringe of the gastrohepatic omentum for good drainage.

5. The best results with few complications are obtained with an anastomosis opening of 2½ cm. diameter.

6. The dumping syndrome should not occur in more than 4 to 5 per cent of cases, and it usually can be controlled with small low carbohydrate meals or by lying down before meals.

7. Gastroenterostomy still has a definite place in the treatment of peptic ulcer but is a compromise procedure and should be reserved for the poor risk patient with low gastric acidity.

8. Vagotomy adds nothing to a well-performed gastric resection and in fact should not be done.

9. Vagotomy should be used only in recurrent stomal ulcer and should be attempted before turning a subtotal into a total gastrectomy.

10. The Billroth I or gastroduodenostomy may have some advantages in gastric ulcer but otherwise has no advantage over the gastrojejunostomy.

In conclusion, I might add there can be no blanket statement regarding the type of gastric resection that should be used. It will have to be fitted to each individual case.

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Surgery of the Pancreas

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The treatment of malignant tumors in and about the head of the pancreas is a challenge to all abdominal surgeons.

In 1935 a great contribution was made to this field when Whipple and his coworkers[1] reported a succesful radical operation for carcinoma of the papilla of Vater. Later Brunschwig[2] performed pancreatoduodenectomy for carcinoma of the head of the pancreas. Since then, many pancreatoduodenectomies have been performed and cures have been reported[3] when the indications for pancreatoduodenectomy was carcinoma of the papilla of Vater. However, reports of 5-year cures have been very few when pancreatoduodenectomy was performed for carcinoma of the head of the pancreas.

PROGNOSIS OF VARIOUS RESECTIONS

Many surgeons have abandoned pancreatoduodenectomy for malignant conditions of the head of the pancreas because of its poor prognosis. However, recently evidence has been presented to justify radical treatment of carcinoma of the head of the pancreas. Cliffton[4] reported an operative mortality for palliative surgery, such as cholecystogastrostomy, choledochogastrostomy, cholecystoduodenostomy or cholecystojejunostomy, of 38 per cent as compared to a mortality of 33.3 per cent following pancreatoduodenectomy. The average survival was 5.4 months after palliative procedures and 2.5 years after resection. Brintnall[5] agreed with this as he found resection of the head of the pancreas for cancer to be of greater palliative benefit than operations which merely divert the biliary flow. In both types of operation, the lesions were thought to be localized in the immediate pancreatic area. It is Waugh's belief[6] that radical resection should be performed because of the possibility that a pathologic examination might indicate that the carcinoma originated in the papilla of Vater.

Although it may be beneficial to perform resection in pancreatic carcinoma, it is well to consider several factors that are largely responsible for the poor prognosis accompanying this procedure.

1. Icterus, so often the physical sign leading to correct diagnosis, appears late in the course of the disease when the carcinoma starts in the head of the pancreas. It takes time for the growth to encroach on the biliary tract.

2. Miller and Clagett[7] reported finding carcinoma of the pancreatic head impinged on the major vessels of the portal region in 37 per cent of cases observed. This may account for early metastasis to the liver by way of the blood stream.

3. Drapiewski[8] emphasized the tendency of pancreatic carcinoma toward extensive invasion of the perineural lymphatics of the pancreatoduodenal region.

4. In addition, the transected end of the common bile duct is often infiltrated with carcinomatous cells via the lymphatics.

Almost the reverse of all of these factors is true in carcinoma of the papilla of Vater, which accounts for attaining better results in this condition.

DIAGNOSIS OF CARCINOMA OF PANCREAS

Owing to the extensive spread of carcinoma of the head of the pancreas, we must strive for earlier diagnosis of this condition. In the early stages of the disease, symptoms are rather obscure. Men are affected more commonly than women, the ratio being about 2 to 1. It is a disease of middle life, two thirds of the patients being from 40 to 60 years of age. Pain is one of the most common symptoms. The statement that malignancy of the pancreas is characterized by painless jaundice is more fiction than fact. Early in the disease pain is spasmodic in type, is located in the epigastrium, and is aggravated by ingestion of food. Pain is usually increased when the patient is in the supine position, and it may be relieved when the patient leans forward or is in the erect position.

Weight loss is the most consistent symptom and is rapid and severe. Fatigue is an early symptom of carcinoma of the pancreas but is less pronounced in carcinoma of the papilla of Vater. Anorexia, nausea, vomiting, and constipation are common digestive symptoms present in pancreatic carcinoma.

Jaundice is a common finding, and Cattell and Warren[9] reported that it occurred in all but three of eighty-eight resectable cases of carcinoma of the head of the pancreas and periampullary area.

The liver, which is not tender to palpation, is usually enlarged. The gallbladder may be palpable and is usually located in a position more lateral than normal, since it projects to the right when it distends. A palpable mass found in the pancreatic area usually means the lesion is of long standing and inoperable.

Anemia is usually a late manifestation of the disease. Hyperbilirubinemia is generally present to some degree and may be of diagnostic value before jaundice is detected. Steatorrhea is usually a late symptom and as a rule means that total obstruction of the pancreatic ducts has taken place. There is no significant change in the serum lipase or amylase levels in carcinoma of the head of the pancreas. Cytologic examination of the duodenal contents appears to have much merit.[10]

Roentgenologic evidence of carcinoma of the pancreas must depend on distortion, displacement, or invasion of the adjacent viscera. Miller and Clagett[7] made roentgenologic studies of the stomach and duodenum in all cases suspected of having carcinoma of the pancreatic head. Roentgenograms demonstrated the lesion in one third of the cases that at operation proved to be malignant.

PREOPERATIVE CONSIDERATIONS

When the diagnosis has been made and pancreatoduodenectomy is the planned procedure, consideration must first be given to the following problems:

1. How must the biliary secretion be shunted into the intestinal tract?

2. Should the remaining part of the pancreas and pancreatic duct be closed or should it be anastomosed to the intestines?

There is general agreement that a choledochojejunostomy is the procedure of choice for shunting of the biliary secretion. When the gallbladder is anastomosed to the jejunum, there is greater increase in ascending biliary tract infections than when the common bile duct is anastomosed to the jejunum. Another drawback to cholecystojejunostomy is that the common duct must be closed separately and that its stump may later open. In the latter case, a fistula or biliary cyst would be the outcome. It also is thought that a stenosis more readily forms when the gallbladder is anastamosed to the jejunum.

Controversy exists over disposition of the pancreatic stump. Brunschwig[11] is in favor of closing the pancreatic stump and believes it offers no hazard to the patient. However, a great number of authorities do not agree with Brunschwig.

TECHNIC

The following is a description of the pancreatoduodenectomy technic which I most recently used:

1. A right paramedian incision was made extending from a position lateral to the xiphoid process inferiorly to a point lateral to the umbilicus.

2. The common duct was isolated and severed at a point superior to the duodenum. Both ends were held closed by a thin-jawed hemostat.

3. The second portion of the duodenum and the head of the pancreas were mobilized medially by using Kocher's method of incising the peritoneum lateral to the duodenum.

4. The gastroduodenal artery was clamped, severed, and ligated.

5. The stomach was severed at its lower third between intestinal clamps.

6. The jejunum was incised between intestinal clamps several inches distal to the ligament of Treitz.

7. The pancreas was mobilized from the superior mesenteric and portal vessels.

8. The pancreas was severed at its neck.

9. The lower end of the stomach, duodenum, head of the pancreas, and the lower end of the common duct were removed en masse.

10. The stump of the jejunum was then sutured over the invaginated cut end of the pancreas using two rows of sutures.

11. The common duct and jejunum were anastomosed a short distance from the pancreatojejunal anastomosis.

12. A side to end anastomosis was used to join the jejunum and the incised end of the stomach.

13. A cigarette drain was placed between the choledochojejunostomy and the pancreatojejunostomy and was brought out through a stab wound.

COMMENT

It is evident from the material presented that radical pancreatoduodenectomy is the most favored surgical treatment for carcinoma of the pancreas. It has been pointed out that this surgical procedure offers much more chance of a cure when the lesion originates in the papilla of Vater than if the tumor begins in the head of the pancreas. However, radical modifications of pancreatoduodenectomy in hope of increasing the life span of patients with pancreatic cancer are being reported. For example, McDermott[12] recently reported a case in which he performed pancreatoduodenectomy and with this procedure partially resected the portal, splenic, and superior mesenteric veins and then anastomosed the superior mesenteric vein to the inferior vena cava. The excision of these portal veins enabled him to remove a much larger block of tissue, and he hopes, thereby, to increase the curability rate of this disease. Until sufficient records are available to permit standardization of technic and to study the effect of the Eck fistula produced, the operative mortality rate, and the average number of years of survival in this particular technic, pancreatoduodenectomy should be depended upon in most cases that are resectable.

SUMMARY

The indications for and probable outcome of radical resection of the pancreatic head and duodenum are discussed. The importance of early diagnosis and factors related to the often poor prognosis are listed. The technic for pancreatoduodenectomy is outlined and comments made as to the possible future surgical approach to carcinoma of the pancreas.

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Brain Tumors

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In order that the patient with nervous system disease be safeguarded, it is very important that he alert himself to signs and symptoms of changes in the body and mind. Recognition of these will then enable him to see his physician, who will use every means at his disposal to make an accurate diagnosis in time to do the patient some good. In 1911 the first dozen patients with brain tumors seen by an Eastern neurosurgeon[1] were blind. He wondered whether he would ever see a brain tumor patient who was not blind. At present people are eager to go to the physician's office for the latest information which will help them fight against disabling illnesses, some of which are due to brain tumors.

DIAGNOSIS

Below are twelve simple rules which I ask my patients to follow. With these rules they can beat me to a working diagnosis of brain tumor.

1. *Shake hands.* If either grip is actually weaker than usual without obvious cause, see your doctor.
2. *Walk.* If you stumble, weave, or lurch and have no reason to, see your doctor.
3. *Smile, frown, close and open your eyes and look in all directions without turning your head.* If you are unable to do this, see your doctor.
4. *Listen to your watch ticking.* If you cannot hear it with one ear as well as the other at the same distance and if you are not already deaf from a known cause, see your doctor.
5. *Stare straight ahead.* If, without moving your head or eyes, you can't see your own hands when your arms are outstretched to the side at shoulder level or at a 45-degree angle above and below it, see your doctor.
6. *Stand up and close your eyes.* If it is difficult for you to keep your balance without touching anything to steady you or if you cannot find your nose with your index finger, see your doctor.
7. *Smell and taste.* If you don't have a cold or some other known reason and are unable to identify odors or tastes, see your doctor.
8. *Feel a key and a coin with your eyes closed. Test each hand.* If you can't instantly tell the difference, see your doctor.
9. *Sit down and scrape your thumb nail from heel to toe on the outside of the sole of your bare foot.* If the big toe sticks up instead of remaining down with the others, see your doctor.
10. *If you have unexplained headaches, fits or spells, dizziness, vomiting, pain or weakness or jerking of the muscles on one side of your body,* see your doctor.
11. *If you are unusually irritable or nervous, if you can't think as well as usual, or if you are having trouble with your memory, speech, or feelings* not accounted for by correctable situations in your environment, see your doctor.
12. *If your doctor finds one of your eyes almost insensitive to a wisp of cotton, if he examines your eyes and finds swelling in the nerve or changes in the blood vessels, or if he finds arm, leg, and ankle reflexes unequal on either side of the body, see him regularly and follow his advice.*

Hippocrates,[2] the great Greek physician who taught and practiced 400 years B.C., said, "Men's heads are by no means all alike to one another," but fortunately they are so much alike that through the universal language of anatomy, internists and surgeons can interpret the syllables of pain, of fits, of paralysis, of numbness and all the troubles that go with it, which through centuries of search and research have, by all the philosophers, scientists, clinicians, and the chronic or acutely ill, been spelled out into words such as polio, heart disease, arthritis, allergy, stroke, cancer, and brain tumor.

Today, in fact, it is a matter of neurologic routine to trace symptoms to their source in the brain or spinal cord or frequently to the protective coverings such as the skull and the spine where lesions due to mechanical stresses often give the osteopathic clinician clues which cannot be measured by pulse rate, temperature, or blood pressure readings.

Any one or any combination of the twelve rules above may call early attention to a brain tumor which otherwise would be missed until by its nature, size, or location it had destroyed the delicate automatic or purposeful functions of the brain or caused death.

Different animal species develop different tumors;[3] for instance, mice have breast cancer but cows do not; tar causes skin cancer in mice but not in rats; tumor of the brain is hardly ever found in animals but is very common in man. In fact, while there is still much to be learned about the causes and cures of brain tumors it is comforting to know that the life history of many space-occupying lesions of the brain and the spinal cord and their coverings has been well charted and is well known. Frequently the kind of tumor present can be recognized by the symptoms it causes and by its location revealed by cranial x-rays, air studies of the brain, x-ray studies of dye-carrying blood vessels, neurologic and Rorschach examinations, and the newer and still experimental uses of I^{131}, P^{32}, and U^{235}.[4-17]

The theory of embryonic rests and the theory of cellular autonomy each seem to hold promise of a reasonable answer to the question, "What makes a brain tumor?" Some cases have come to light following chronic irritation or an injury but, except for the meningioma group which sometimes seems to occur at the site of skull injury,[18] biochemistry must be relied on for the answer. Biochemists have shown that neoplastic transformation of a tissue results when its cells acquire the ability to grow anaerobically with a fermentative type of metabolism.[19]

DIFFERENTIAL DIAGNOSIS

It has been said, "The important thing is *suspecting* the tumor early—and then following that suspicion with all the diagnostic means at our command."[20] Since a differential diagnosis must first be made, the importance of using every available means of diagnosis can readily be seen.

Extradural hematoma[21] can be suspected with a fractured skull and torn artery, in the presence of a fixed and dilated pupil, contralateral weakness, and coma, and in the absence of blood in the spinal fluid. In this situation operation must be performed within 8 hours. Subdural (acute or chronic) hematoma[22] shows more direct cortical irritation, increased intracranial pressure, and, usually, bloody spinal fluid. There is not necessarily a history of injury, and the blood is of venous origin.

Subdural hygroma[23] often simulates intracranial hemorrhage or hemorrhage into a brain tumor. Spontaneous subarachnoid hemorrhage is so characteristic[24] that diagnosis is easy following the sudden rupture of an aneurysm in the skull cavity, attended as it is by ex-

cruciating headache of sudden onset without paralysis or fits, but with restless termination of all usual activities and inability to do anything but stay in bed under ineffectual sedation. Once the condition is diagnosed, spinal puncture should be done and repeated as necessary. The best time to perform angiography in these cases is still debatable,[25,26] but the process has its place in neurosurgical diagnosis.

Cerebral edema secondary to concussion or alcoholic hydration should, from the history, cause no great diagnostic difficulty, but its diagnosis has been missed too often. Medical decompression, cautious use of spinal puncture, and a dry diet make up the conservative treatment, but subtemporal decompression may be a successful last resort if a ventricular puncture through an occipital burr hole has first been made to reduce the intraventricular cerebrospinal fluid pressure.

A space-taking lesion in the brain which must be differentiated from tumor is the brain abscess. When it follows the usual pattern of extension from an infected sinus or mastoid or a dirty wound of the scalp it is reasonably detectable. Since the advent of the sulfa drugs and antibiotics, brain abscess is not so common. I feel certain that a substantial number of deaths attributed to emboli may actually have been due to cerebral abscess from bacterial endocarditis associated with rheumatism or a congenital heart condition. Cardiologists have told me that caution and antibiotic prophylaxis should be used for cardiac patients on whom tonsillectomy or a dental extraction is to be performed. Stellate ganglion block is an early possibility in the right case. Some forty cases have been reported in the literature in which infected emboli were the cause of brain abscesses. I operated for this condition in a 13-year-old boy referred by Dr. J. M. Watson.[27] We made Pantopaque studies showing the location and extent, with a drain in situ. Subsequent aspiration evacuation was followed by recovery. Beller[28] says that "in each case of cerebral complication in congenital cardiac disease air studies should be performed in order to rule out a space-occupying lesion. In most instances early recognition of the syndrome will permit surgical intervention with cure."

Chronic arachnoiditis, whether of traumatic or infectious origin and whether cystic or adhesive, can be confusing.[29] Arachnoiditis in the vicinity of the optic chiasm and in the posterior fossa[30] and the basal cisterns is amenable to surgery. It must be differentiated from tumor. Depressed skull fractures[31] should be identifiable if a proper history has been taken. Localized pressure can be identified as resulting from an osteoma of the skull if a tangential x-ray of the skull has been taken. The osteoma should be removed surgically.[32]

Meningoencephalitis should be thought of, especially if, as in California this year, outbreaks of equine encephalomyelitis and poliomyelitis occur. Three patients were treated recently in the Service of Neurology and Neurosurgery at the Los Angeles County Osteopathic Hospital; two cases simulated tumor but were encephalitis; the third had all the symptoms of meningoencephalitis and, at my request, the patient was thoroughly studied and quarantined in the contagious disease ward. The titers, smears, and cultures were inconclusive. She was removed from the hospital to a private institution and, at surgery, inoperable cancer of the brain was found.

Percival Bailey[33] has made some sage observations regarding differential diagnosis of intracranial tumors: Whenever in these cases the blood pressure is high it is best to treat the patients as primary vascular lesions because craniotomy in cases of hypertension usually ends in fatality from cerebral hemorrhage. . . . It has been demonstrated many times that *lues of the brain, which has not responded to medical treatment may do so promptly after a craniotomy has been made* . . . . operation is attended with a very small mortality provided it is made with local anesthesia.

Finally, in arriving at a diagnosis it is necessary to rule out multiple sclerosis, hydatid cyst (usually in the foreign-born Greek), cortical atrophy due to arteriosclerosis or lead or other toxic encephalopathy, and, in children,[34] numerous possibilities. Familial amaurotic idiocy in five stages from about the age of 5 to 8 years to death at about 18[35] runs the whole gamut of brain tumor symptomatology yet there is no tumor.

MANAGEMENT

On the basis of the foregoing it is easy to see why, if there are no obvious contraindications, I believe every uncertain brain case should be approached as though it were tumor because tumor can be diagnosed or ruled out, and, if a tumor is present, treatment can be started at once.

After having ruled out all other probabilities and concluded that the lesion is a brain tumor, it is necessary to decide where it is, what kind it is, and the choice of treatment.

Location of the brain tumor is determined by the objective and subjective neurologic examination,[36] by electroencephalography,[37] ophthalmoscopy,[38] ventriculography,[39] and, possibly, arteriography.[13]

The type of tumor will be determined by the history of the progress of symptoms, by the location at which it is finally found, and, in some clinics, by the use of I^{131} or di-iodofluorescein.[40] The age of the patient is very important in diagnosis for in infants the enlarging head is a symptom; in children, vomiting; in adults, the convulsive state,[41] cerebrovascular accidents, and headache;[42] and, in all ages, failing vision. The age group is also an index to the probable tumor type; for instance, a study of brain tumors found in the first 60 days of life showed gliomas preponderating.[43] In children cerebellar astrocytomas and medulloblastomas are found in the subtentorial region. Twenty per cent of all tumors of the nervous system occur before the age of 21, the majority being primary to the cerebellum.[44]

Brain tumors occur most often in the 25- to 50-year group. With the exception of the small number (3 per cent) of metastatic tumors of the brain which may occur anywhere, certain areas are sites of predilection for certain tumor types. For instance, benign meningiomas stem from the points at which the dura is attached to the skull, and thus are frequently sagittal, basal, or near the olfactory groove.[45,46]

Indicative of disturbance at the area of the optic chiasm and the diaphragma sellae are glandular syndromes, including the thirst and polyuria of diabetes insipidus; the asthenia of tuberculosis, with which an inoperable tuberculoma may be related; and, associated with eosinophilic adenomas, the well-known syndrome of gigantism in the ages before the epiphyses have closed and acromegaly afterwards; and Cushing's syndrome which is diagnostic of basophilic adenoma (although it is often more adrenal than hypophysial). Also indicative of such disturbance are intracranial pressure symptoms and the characteristically ballooned sella seen on the lateral survey film of the skull, and the Rathke's pouch tumor which is distinguished by calcification in over 80 per cent of the cases and also

by Frölich's syndrome in the presence of primary optic atrophy with choked disks. Roentgen irradiation, intensive estrogen therapy, and surgical frontal approach under the dura to the sphenoid ridge with aspiration and suction of the tumor from its position in relation to the sella and the optic nerve are the treatments of choice.

The treatment of brain tumor in children presumes certain modifications of approach and prognosis which vary not only with the pathology but also with the location.

Glioblastomas are primary, malignant, invasive tumors which spread through the brain and are unencapsulated. They occur in males twice as often as in females. The average duration of life after the first symptom in Netsky's series was 17 months; it was 12 months in nonoperated cases.[47] Therefore, it appears that operation alone does not significantly increase longevity, that radiation has very little effect, if any,[47-49] but a decompression will relieve the insufferable headache.

It has been well said that luck in exposing a lesion of the proper type favorably placed is more important than the surgeon's skill in handling gliomas.[48] These tumors are primarily frontotemporal and they cause personality changes and aphasic and contralateral hemiparetic signs. Working with a colleague,[50] I recently had such a case. The tumor extended through the corpus callosum.

Oligodendrogliomas are slow-growing, usually low-grade malignant tumors which show layers of calcification on simple flat lateral and anteroposterior skull x-rays. These tumors can be removed by a radical operation if they occur anywhere except in the motor area of the hemispheres. A case referred by a colleague[51] proved to be just such a lesion, squarely across the motor cortex. Since Horrax and Wu[48] found the average survival period in their cases to be 7 years after radical removal of the tumor, I performed subtemporal decompression rather than an operation which would so cripple the patient that life would be useless.

According to Olivecrona[52] cerebellar angioreticulomas are found in adults showing severe pressure symptoms which may be detected by retinal examination. Ventriculography should be followed by immediate removal of the arch of the atlas, after bilateral suboccipital exposure, using high spinal anesthesia and nitrous oxide and oxygen intubation.

Blood vessel tumors such as hemangiomas can cause surgical difficulty, but the recovery record following their removal is better than that of any other intracranial lesion.

Certain tumors, such as hypernephroma, pheochromocytoma, sarcoma, and carcinoma, metastasize to the brain from the kindey, adrenal medulla, bones, lung, breast, thyroid, prostate, or gastrointestinal tract.

The outlook in hypernephroma is pessimistic.[53] If the primary tumor is removed by nephrectomy, brain surgery has a somewhat better prognosis. The path of metastasis is via the veins of the spinal cord or through the inferior vena cava or carotid or vertebral arteries to the brain.

Pheochromocytoma[54] is usually benign in adults but highly malignant in children. Paroxysmal hypertension, clinical and laboratory evidence that the attacks are due to a pressor agent, and x-ray evidence of adrenal enlargement as shown by perirenal air insufflation are diagnostic of pheochromocytoma. The primary tumor should be removed of course, and this may result in acute adrenal insufficiency.

In the remainder of the metastastic tumors[8] which make up the 3 per cent referred to previously, the best that can be said is that if a solitary lesion can be found there is a possibility that it can be removed, but the prognosis is bad even with radiation and surgery.

The whole problem is pointed up in a large necropsy series[1] in which tumors of the brain were fourth in incidence, following tumors of the uterus, the stomach, and the breast. Recent studies have emphasized the increase in cancer of the lung. I am interested in finding out why the sites of reproduction and nourishment, that of intellection, sensation, and muscular control should, with the site of aeration, be the most severely threatened.

THE OUTLOOK

Some of the answers to the questions, "What treatment is available?" and "What hope is there for eliminating the disease?" may lie in the following:

1. Educating the public regarding prevention.
2. Educating the public to recognize the first symptoms.
3. Training all physians in tumorology.
4. Developing specialty colleges such as the American College of Osteopathic Surgeons, the American College of Ostetopathic Internists, and the American College of Neuropsychiatrists for the specialist-training program which the public is demanding and which a mature profession requires.
5. Research development in chemical, biologic, and the new atomic fields.

At the College of Osteopathic Physicians and Surgeons a Diagnostic Center is in the process of establishment, and members of its Cancer Training Program have begun to measure the amount of atomic radiation to which everyone is exposed.

Still in the definitely experimental stage is the ultrasonograph which bounces ultrasound waves through the brain; if tumor is encountered, the echo is disturbed.[55] The use of U^{235} is described as a possible treatment.[17] Boron is being introduced in solution by vein and split by nuclear fission as the patient, in a lead-lined compartment, is bombarded by atomic action.[56] As yet there is no knowledge as to how effectively neutrons destroy tumor tissue.

6. Insistence on x-ray therapy preoperatively and postoperatively and, if surgery is indicated, radical excision.
7. A high index of suspicion which will prevent the physician from overlooking tumor signs and symptoms.

In closing this paper on brain tumors, let me emphasize that surgery of the brain should be done without special concern over the operative time involved but with heightened sensibility to the personal, socioeconomic, and brain-tissue future depending on each stroke of the electrocautery and every millimeter of Bard-Parker depth. It may be spectacular to remove a hemisphere, but it is to no good purpose if the patient is left mentally unbalanced, unable to use his body, and an economic and nursing problem to the end of his life.

649 S. Olive St.

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Appendicitis in Children

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The subject of appendicitis may be regarded by some as elementary, but despite the steady reduction of deaths from appendicitis, in children as well as in adults, this disease continues to challenge the diagnostic acumen and surgical judgment of all practitioners, and in the field of pediatric surgery appendectomy continues as the most frequently performed intra-abdominal procedure.

In this paper, contrary to the usual procedure, I shall present my conclusions first and then amplify the most important points.

1. Parental awareness and genuine concern over all persistent abdominal pain in children and parental willingness to refer suspicious symptoms to the family physician for evaluation will best serve to reduce the dangers in appendicitis.

2. If the physician will show considerate regard for parental concern when alerted to these symptoms and suspect appendicitis until diagnosis proves otherwise, great strides will continue to be made in the safe surgical handling of the disease.

3. Early recognition and surgical treatment within 12 to 24 hours after onset of symptoms practically insures that there will be no unusual surgical problem and little or no attendant risk, primarily because there is usually a low incidence of perforation in the early hours of the process.

4. Persistence of symptoms beyond the 24-hour period is associated with a sharp rise in the incidence of appendiceal rupture. Appendicitis with peritonitis remains a major surgical problem and carries with it an increased risk. That the disease may proceed along a more rapid and deadlier course stresses the need for establishing accurate early diagnosis in the child.

5. Utilization of chemotherapeutic and antibiotic agents without establishing diagnosis causes confusion

and results in delay and loss of valuable time. Such medication may serve to lull the family and the physician into a false sense of security. These drugs have their place, along with public and parental education, early diagnosis, adequate preoperative preparation, better anesthesia, improved technical skill, controlled fluid balance, gastrointestinal decompression, anticipation of complications, anticoagulant therapy, and early ambulation; all have combined to bring about a lowering of mortality in appendicitis.

DIFFERENCES IN APPENDICITIS IN CHILDREN AND ADULTS

In childhood the factors which govern the natural course of the disease process are quite different from those in the adult, and although the process is the same, the response of the host is not consistent with the textbook picture and not altogether typical. If the child possesses a natural or acquired immunity, it is minimal; thus the virulence of the offending organism is unmitigated. Then, too, the functional capacity of the omentum to wall off the process is limited by its immature development, thinness, and inability, because of its shortness, to reach and envelop the appendix in the lower quadrant. The rapidity of occurrence of generalized peritonitis in a high percentage of cases can be further explained by the inability to establish a secondary line of defensive localization by which loops of intestine, mesentery, cecal wall, or parietal peritoneum, through adherence to each other, form a pocket which encases the appendix and makes a regional abscess.[1]

PATHOLOGY

The response to the inflammatory process in appendicitis will vary according to the rapidity of the process. Inflammation begins in the mucosa or submucosa, with leukocytic infiltration, congestion, edema, and hemorrhage, bringing ultimate ulceration of the mucosa and distention of the lumen by accumulation of purulent exudate. This process may be accelerated by thrombosis of the appendiceal vessels in the involved area, whether in the base, body, or distal region, resulting in gangrene, perforation, or rupture. Defensively there is an outpouring of fibrin from the involved serosal surface, inviting nearby adhesions to restrain the spread. In the adult the omentum may envelop the appendix and aid in the walling-off process. This is not necessarily the case in children. The free fluid in the abdominal cavity, containing fibrin and leukocytes, is sterile, but provides an ideal medium for bacteria which, by traversing the permeable inflamed wall or the gangrenous perforation, contaminate the peritoneal cavity. This is particularly serious when omental encasement or other walling-off has not developed. General peritonitis is thus to be feared in the child to a greater degree, as the defensive mechanism may fail.

ETIOLOGIC ASPECTS

Whether bacteria related to respiratory infections predispose to appendicitis is open to conjecture; however, there is a higher incidence of appendicitis when respiratory infections are prevalent. Fecaliths and inspissated feces are often found at operation and must play an important role in the onset of disease of the appendix. Previous inflammatory episodes which have subsided predispose to acute appendicitis through residual scarification of the lumen which may block drainage and precipitate the acute process.

SIGNS AND SYMPTOMS

Recognition of appendicitis in children has long been regarded as difficult. The combination of pain, nausea and vomiting, and slight fever must be considered a sign of appendicitis until proved otherwise. Vomiting and fever may precede the onset of obvious abdominal discomfort, but, particularly in an infant, parents often fail to suspect appendicitis until he shows irritability or flexes his thighs on the abdomen. Early evaluation and repeated examinations at short intervals are necessary. The result of family-physician cooperation in evaluating signs and symptoms is highly rewarding. A painstaking routine particularly adjusted to child acceptability and designed from the first step to gain his confidence is fundamental in pediatric examination.

The history should be examined for any past experiences of similar nature, and an orderly detailing should be made of variations in the major systems—gastrointestinal, genitourinary, respiratory, and neurologic—as they pertain to the present complaint. This is important in the differential diagnosis of appendicitis. In cases presenting a difficult diagnosis, a careful analysis of symptoms and their relationship to one another should be made, so that a correct diagnosis may be reached without too much delay. An inadequate history and physical examination may result in erroneous diagnosis and lead the unsuspecting surgeon into difficulties. The true diagnosis may not be appendicitis, and it is hazardous to rule out any diagnosis by surgical exclusion. Fortunately confusing entities in children are limited since there are minimal potentialities in the pelvis and upper abdominal region.

Just as important are the variations from the classical pattern of appendicitis. The condition may indeed be appendicitis but the symptoms quite difficult to correlate, particularly as to pain location: There may be onset and persistence of pain in the right lower quadrant or lateralward, diffuse nonlocalized midline pain, pelvic location of pain, or right upper quadrant pain due to possible incomplete rotation of the cecum and hence displacement of the appendix and local pain. It is only by the best of diagnostic practice that the most common variants of symptoms will be recognized and properly treated along with the typical or classical.

DIFFERENTIAL DIAGNOSIS

A percentage of cases of suspected appendicitis may in fact be mesenteric lymphadenitis.[2] Where differential diagnosis cannot be made, laparatomy is indicated. Mesenteric lymphadenitis should always be considered because symptomatically there are strong elements of resemblance to acute appendicitis, even to localization of pain in the right lower quadrant, though usually this is not as distinct as in acute appendicitis. Cases of idiopathic peritonitis are occasionally incorrectly diagnosed as peritonitis of appendicitis; when laparotomy confirms the latter, drainage is instituted. However, the trend is toward conservative treatment of idiopathic peritonitis.

CLASSIFICATION OF APPENDICITIS

Appendicitis may be classified into various types of progressive seriousness. The greatest challenge to surgical judgment comes when an irreversible process has extended beyond the appendix and still must be dealt with as a degree of appendicitis.

Simple Acute Appendicitis.—This type of appendicitis conforms to the limited pathologic process already described and, by virtue of its limited involvement, presents no problem in the routine surgical treatment. This is the only appendiceal inflammation which does not advance beyond the confines of the appendix.

Acute Appendicitis with Local Peritonitis.—The inflammatory process is lightly contained by the localizing effect of peritoneal exudate, intestinal loops, omentum, cecum, and peritoneum. Usually no mass is found at examination.

Acute Appendicitis with Appendiceal Abscess and Localized Mass.—This localized form of abscess may differ according to the degree of the pathologic process. There are two types of localized mass which, because the symptoms and findings are the same, cannot be differentiated clinically. In one the palpable mass consists of cellulitis of the appendix and of adherent surrounding structures, caused by inflammatory induration or periappendicitis, the appendix not having ruptured. The other type is specifically due to acute suppuration, with tissue destruction and abscess formation. The significance of these two types becomes apparent in the response to conservative treatment usually accorded appendiceal abscess as such.

Acute Appendicitis with Acute, Diffuse Spreading Peritonitis.—In this type the pathologic process has not been contained and the perforated appendix produces a spreading peritonitis. It is suspected that continuous leakage arises from an area not susceptible to walling off. This is most likely to arise from a perforation near the base and the cecum. Inability to wall off such a leakage is evidenced by the clinical sign of diffuse peritonitis. Other sites of perforation, such as the upper two-thirds, may be confined after the initial spill by the omentum, et cetera, only to break this barrier and diffuse rapidly, with the spreading signs superimposed on those of the localized mass previously regarded as limiting the process.

TREATMENT

Simple Acute Appendicitis.—The most important task of the surgeon is to judge accurately the status of the case by all means at his command, keeping in mind the category of the disease process and applying certain principles of treatment based on correct interpretation of the pathologic process. As stated before, simple acute appendicitis presents no problem, and operation according to any standard technic will result in uneventful recovery.

Appendectomy in Acute Appendicitis with Local Peritonitis.—Treatment differs little in technical detail from that of the simple acute type. The primary concern of the surgeon in the operative management of these cases is whether he should drain the site of appendectomy or close it without drainage. There are two schools of thought on the subject. With the advent of newer antibiotics, such as aureomycin, excellent statistical data have been compiled showing the good results of nondrainage. However, it is with the purpose and reasoning which lie behind choosing to drain that we are concerning ourselves.

According to one authority,[3] if any one of the following conditions obtains in appendicitis with local peritonitis, a drain should be used.

Perforation, either pathological or technical, with gross contamination of operative field
Compromise or necrosis of tissue left in operative field
Smear of seropus revealing two or more organisms
Exposure of retroperitoneal tissues
Uncontrolled bleeding or oozing
Insecure closure of appendiceal stump
Severe operative trauma due to technical difficulties

One or two soft Penrose drains should be inserted, one along the lumbar gutter and one in the pelvis, specifically between the viscera and parietal peritoneum. The drains should be removed in 2 or 3 days, depending on how the patient responds. Whether or not a drain is used, chemotherapy is advisable.

Surgical Management of Appendicitis with Localized Abscess.—The fundamental treatment for this process is conservative, with elective removal of the appendix at a date based on clinical response to therapy. It is accepted that 50 per cent of appendiceal abscesses will subside and resolve completely; 25 per cent will subside to a minimal degree, at which time surgery should be instituted; 15 per cent will remain the same or subside very slightly, and will require early operation; and 10 per cent will get worse and will require immediate surgery.[3] Since the response is so variable, each case should be treated individually; basic therapy should be instituted, including absolute bed confinement in a semi-Fowler position, adequate fluid balance, either orally or parenterally, and antibiotic and chemotherapeutic agents according to weight. Daily laboratory tests are advisable and close clinical observation is necessary in order to chart the progress of the case. As long as improvement is evident, conservative treatment is continued. If the patient does not improve, operation should be performed.

There are still those who believe in operating promptly for appendiceal abscesses. Sufficient supportive therapy is instituted to make the patient the best possible operative risk. Such therapy includes establishment of hydration, administration of antibiotics and blood, decompression of the gastrointestinal tract, and so forth. A lateral McBurney type incision is recommended; the peritoneum, instead of being entered directly, should be reflected to prevent direct entry into the abscess cavity; all material such as pus, exudate, and slough is aspirated, and drainage is instituted with a Penrose drain. Drainage is necessary for a longer period than in appendicitis with local peritonitis, in order to give the area time to evacuate. Slow healing is encouraged so that premature closure above is prevented. Postoperative care is vigilant, with attention to antibiotics, fluids, and clinical observation for complications.

When the case has been handled conservatively or drainage has been instituted, the parents must be advised that the appendix has not been removed and that subsequent appendectomy will be indicated within a 3- or 4-month period.

Acute Appendicitis with Acute Diffuse Peritonitis.—Usually children with this condition are quite ill and require great efforts to bring them into balance with a systemic supportive regimen in preparation for operation. This should be done as quickly as possible, as the focus of infection must be eliminated by surgical means. Fluids for establishment of rehydration and antibiotics in massive doses should be instituted. Surgery should entail the removal of the perforated appendix. Having so removed the focus, some surgeons aspirate all seropurulent material and close the incision without drainage. If gross contamination is observed, drainage should be the rule. Cigarette or Penrose drains should be placed at the site, one in the right colic gutter and one into the pelvis. The postoperative care usually will include sedation, control of distention by intestinal decompression, fluid replacement including blood, oxygen therapy and antibiotic therapy. Results will depend on careful preoperative preparation, surgical skill, and vigilant and adequate postoperative care.

Antibiotic Therapy.—Indiscriminate use of anti-

biotics in the undiagnosed prelocalizing stage of appendicitis is cause for concern because the significant signs which in sequence ordinarily lead to accurate diagnosis and proper treatment may be masked. The antibiotic regimen has its place, but only after the diagnosis has been established. Antibiotic and chemotherapeutic agents have a valuable place as prophylactic, supportive, and therapeutic aids; however, postoperative complications such as unrecognized abscess are masked by their use. But valuable as they may be, these agents cannot take the place of the only sure, safe, and permanent treatment of appendicitis—appendectomy.

SUMMARY

1. Early recognition of symptoms leads to early surgical treatment. Parental awareness of early pain symptoms and the physician's regard for parental concern are vital. Appendicitis should be suspected until proved otherwise.

2. Children do not possess a facility comparable to that of adults to withstand the irreversible process of appendicitis.

3. Treatment based on correct interpretation of the pathologic process is presented.

4. The indiscriminate use of antibiotics without establishing diagnosis is condemned.

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Surgery of the Adrenal Gland

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One of the most rapidly unfolding chapters of medical science is that relating to normal and abnormal functioning of the adrenal gland. There is scarcely a field of medical practice which is more replete with promise or which poses a more fascinating challenge to the research scientist, the medical internist, and the surgeon.

I will make no attempt to cover the broad and as yet limitless aspects of the relationship of the adrenal gland to the patient undergoing surgery. Rather, it is my purpose to delineate the place of surgery in the modern management of anatomic and functional lesions of the gland itself.

Just as the advent of antibiotic therapy has opened the door to successful intrathoracic surgery, so has the availability of ACTH and cortisone brought many hitherto untouchable lesions of the adrenal gland within the realm of successful surgical attack.

It is well to preface this discussion with a brief review of the embryology, physiology, and anatomy of the adrenal glands.

The adrenal gland may be thought of as two glands in one, the cortex and medulla being distinct as to embryologic origin and as to function.

The medullary portion, of ectodermal origin, arises from the cell masses of the neural crest which also gives rise to the sympathetic ganglion cells. The function of the adrenal medulla is to secrete epinephrine and norepinephrine, which increase systolic blood pressure and mean arterial pressure. Epinephrine elevates the blood pressure by increasing cardiac output, while norepinephrine raises the pressure by increasing peripheral resistance. This fact may be of significance in postoperative management of adrenal surgery cases.

The adrenal cortex, however, is of mesodermal origin, and arises from the mesonephros in close proximity to the primitive sex glands. The physiology of the adrenal cortex is quite complex, which serves to explain the variety and complexity of the clinical syndromes resulting from disturbed adrenocortical function. Some twenty-eight different steroids have been separated from the adrenal cortex. Of this number, about six have been shown to be biologically active hormones (adrenal corticoids).[1] These six active steroid hormones fall into three types:

1. 11-desoxycorticosterone, which has to do with controlling salt and electrolyte metabolism.

2. Androgenic steroids, which effect a sex function and bring about positive nitrogen balance.

3. Compound F-like hormones, which include compound F (hydrocortisone) and compound E (cortisone). This type of hormone is chiefly concerned with carbohydrate and fat metabolism.

The adrenal gland consists anatomically of an outer cortex surrounding a highly vascularized medulla. At birth the major portion of the adrenal gland is composed of cortex. This cortex is composed, in turn, of a thin outer layer of cortical cells similar to that seen in later life, and a larger inner androgenic or X zone, which normally undergoes degeneration during the first few months of life. The true cortex continues to develop until about middle life, with the most rapid growth seen just before and during puberty. It is thought by some that a persistence of the androgenic zone, or hyperplasia of this area, can lead to symptoms of Addison's disease through a crowding out of the other layers of adrenal cortex.

Accessory adrenal bodies (Marchand's bodies) may occur as aberrant adrenal tissue in various locations. These adrenal rests presumably are left during embryologic development in the complicated descent of the adrenal components to their position above the kidney. Likely locations for aberrant adrenal tissue include the retroperitoneal tissues of the paracolic gutters, the broad ligaments, the ovaries, and the testes. Tumors in these adrenal rests can cause symptoms similar to those of neoplasms within the adrenal gland.

LESIONS OF ADRENAL CORTEX

Tumors of the adrenal cortex, according to Kenyon,[2] may produce a variety of clinical syndromes which may be classified as follows:

1. Adrenogenital syndrome.
2. Cushing's syndrome.
3. Mixed adrenogenital and Cushing's syndrome.
4. Single *endocrine* manifestation.
5. Feminization in men, or, rarely, precocious menstruation and breast development in girls.
6. No endocrine manifestation.

Of these the adrenogenital syndrome will be touched on briefly and Cushing's syndrome more at length.

Adrenogenital Syndrome.—

The adrenogenital syndrome may result from either tumor or hyperplasia of the adrenal cortex. The findings in this syndrome vary according to the sex of the patient and the stage of physical development at which cortical hyperactivity begins.

The commonest adrenal disorder encountered in childhood is congenital adrenal hyperplasia in the female, which produces the clinical picture of pseudohermaphrodism. The genitals present a mixed appearance and the true sex may remain doubtful. Surgical exploration may reveal the true sex of the child, but the attitudes and aptitudes of the patient are not always consistent with the gonads found at surgery. Pseudohermaphrodism results from excessive androgenic function from hyperactive and usually hyperplastic adrenal cortices. Treatment is complex and difficult. Resection of the adrenals is not recommended because atrophy may occur as the patient grows older.[3] Current treatment revolves around an attempt to depress the excessive androgenic function through administration of cortisone.

The syndrome may begin in young girls, or later during adolescence or adulthood. Symptoms are those of masculinity with less abnormality of the genitals. When the onset of the adrenogenital syndrome occurs during the postnatal period or later in life, it is more often due to tumor than hyperplasia, and exploration of the glands may be warranted. In the adrenogenital syndrome occurring in young boys, signs of homologous sexual precocity and premature puberty appear. Treatment is similar to that of girls.

Cushing's Syndrome and Disease.—

This syndrome is brought about through a disturbance in the third general category of adrenocortical steroids, which have to do with sugar and fat metabolism. The term "Cushing's disease" has been applied to intrinsic adrenal disorder, whereas in "Cushing's syndrome" the adrenal disturbance is thought to be secondary to excessive pituitary stimulation. It is now felt that whatever the basic etiologic factor, the fundamental disorder is in the adrenals, and treatment is directed toward these glands.

The main physiologic disturbance in Cushing's syndrome is hyperglyconeogenesis, excessive conversion of noncarbohydrate substances (chiefly protein) into carbohydrates.

The essential features of Cushing's syndrome are obesity, usually of a buffalo type, hypertension, atrophy of the skin, depressed gonadal function, decreased sugar tolerance, erythrocytosis, osteoporosis, fatigability, and weakness. The typical Cushing's syndrome patient has an enlarged, rounded face described as a "moon face." There is commonly a deposition of fat in the cervicodorsal area called a "buffalo hump." Ecchymoses are usually present, and the skin bruises easily. There is abnormal urinary steroid secretion. The 17-ketosteroids may be normal or slightly increased. The 11-oxysteroids are usually markedly elevated. The fasting eosinophil count is usually below 100. If the count is much above this figure the disorder is probably not Cushing's syndrome.[4]

In differential diagnosis there may be confusion with the adrenogenital syndrome. Indeed a mixture of Cushing's syndrome and the adrenogenital syndrome may be present. Cushing's syndrome may also be confused with what has been called the syndrome of large pale ovaries (Stein-Leventhal syndrome). In the syndrome of large, pale ovaries there is hirsutism with marked femininity; in adrenogenitalism there is increased strength and true virilism; while in Cushing's syndrome there is muscular weakness and pseudomasculinization.[4]

In the treatment of Cushing's syndrome, stilbestrol and testosterone have been used, but use of these agents constitutes only symptomatic therapy. Roentgen therapy to the pituitary is recommended only occasionally for a mild condition.[3]

The current treatment of choice is exploration of the adrenal glands, removal of a tumor if found, and, if no tumor is present, adequate resection of adrenal tissue.[3] The surgeon may not know preoperatively whether he is dealing with a cortical tumor or hyperplasia, since identical clinical symptoms can be produced by either. Decision as to the type of surgical procedure is made when the first gland is exposed and examined. This can be done because in the presence of a functional cortical tumor on one side the opposite adrenal gland is always atrophic.[3] Priestley[5] describes the procedure at the Mayo Clinic as follows: If a tumor is encountered on the first side, it is removed. If an atrophic adrenal is found, the opposite gland is exposed with reasonable expectancy of finding a tumor. "If the first gland is not atrophic, subtotal (90 per cent) resection . . . is performed. . . . If the syndrome is produced by adrenal cortical hyperplasia and subtotal (90 per cent) adrenalectomy is performed on one adrenal gland, a second operation is performed after an appropriate interval on the opposite adrenal gland."

The interval between the two operations depends on the patient's progress, but, at present, Priestley usually allows about 2 weeks to elapse before performing total adrenalectomy on the second adrenal.

Preoperative and Postoperative Care:

If a functioning adrenal tumor is removed, adrenal insufficiency will occur, owing to atrophy of the opposite gland. This must be anticipated preoperatively and cortisone should be administered. Testosterone and high protein intake have been recommended.[6] Priestley[5] gives 200 mg. of cortisone 48 and 24 hours before surgery, and again the morning of surgery. If a tumor is removed cortisone is administered in decreasing amounts for the first 5 or 6 days. If no tumor is found, and extensive resection of only one gland is performed, cortisone need not be given postoperatively. At the time the second gland is operated on, cortisone is given before and after surgery.

Convalescence may be prolonged after extensive bilateral resection of the adrenal glands. This also may be true after removal of a tumor. Cortisone must be

used judiciously. The viability of the adrenal remnant can be difficult to evaluate.

Results:

In the precortisone days mortality in surgery for Cushing's syndrome approached 100 per cent. Even now some reports give a mortality of 44 per cent.[6] In twenty-nine cases at the Mayo Clinic,[5] there were six deaths, all of which occurred before cortisone was available. After cortisone was used there were no deaths. Excellent remissions were obtained in nineteen cases; however, three of these showed recurrence of symptoms. There was one case of Addison's disease and there were two cases of questionable Addison's disease.

The recurrent cases may be treated by further resection of adrenal tissue or roentgen therapy to the pituitary gland.[3]

LESIONS OF THE MEDULLA

Pheochromocytoma.—

Tumors of the adrenal medulla include the neuroblastoma, a highly malignant tumor occurring in children, and its less malignant counterpart in the adult, the ganglioneuroma. The medullary tumor of chief interest at the present time, however, is the pheochromocytoma. This is a functioning neoplasm arising from chromaffin cells and producing a hypertensive syndrome. This hypertension may be either paroxysmal or sustained in type. The attacks of hypertension are similar to those following administration of large amounts of epinephrine, norepinephrine, or both. In addition, a disturbance of carbohydrate metabolism and/or hypermetabolism may exist. In a typical attack there is a sudden rise in blood pressure with tachycardia, anxiety, headache, pallor, numbness, tingling, epigastric and precordial pain, and, lastly, excessive sweating.

Certain pharmacologic tests are helpful in establishing the diagnosis. In cases of paroxysmal hypertension administration of histamine, tetraethylammonium chloride, and methacholine (Mecholyl) chloride will produce characteristic attacks. In sustained hypertensive cases piperoxan hydrochloride (933F), Regitine, or Dibenamine will lower the pressure by blocking the pressor effect from the pheochromocytoma. The patient's cold-pressor response should be evaluated before using the pharmacologic tests.[7]

It is of prime importance to control the patient's blood pressure during operative removal of the pheochromocytoma and during the postoperative period. As the tumor is approached and manipulated there is usually a rise in the pressure which may reach an alarming level if uncontrolled. Vasodepressor drugs such as Regitine or Benodaine are used to control the hypertension. With the removal of the tumor a precipitous drop in pressure invariably occurs. Vasopressors are now given, usually epinephrine and/or norepinephrine or Neosynephrin. The vasopressor is used in a continuous intravenous drip for the first few days after surgery, the rate being determined by the patient's pressure.

OPERATIVE CONSIDERATIONS IN ADRENAL SURGERY

Preoperative Localization.—While it is desirable to know the location of tumors preoperatively, efforts to demonstrate them are frequently unsatisfactory. Only about 50 per cent are visible on air insufflation studies of the perirenal areas or in intravenous urograms.[7] Since there is some danger inherent in the air insufflation technic is is not routinely used. Rivas[8] has suggested injecting the air or gas between the coccyx and rectum, which may prove advantageous.

Surgical Approach to Adrenal Tumors.—

The Cushing's syndrome patient is always obese and the transabdominal approach is too deep to be satisfactory. Young's[9] bilateral posterior subcostal incision or a transthoracic approach is occasionally employed. The exposure of choice appears to be the unilateral posterolumbar incision similar to that used to expose the kidney.[3]

In pheochromocytoma, however, the patient is invariably thin, and the transabdominal incision is best employed. This allows exposure of both adrenals and permits exploration for extra-adrenal tumors which are present in about 10 per cent of cases.[3] These aberrant chromaffin tumors, called also paragangliomas, are usually periaortic in position, but occasionally one arises from the thoracic sympathetic plexus.[7] In some 10 per cent of the cases, bilateral tumors will be encountered.[3]

ADRENAL RESECTIONS IN OTHER CONDITIONS

Subtotal or total adrenalectomy has been performed in some cases of severe hypertension. Huggins[10] has performed bilateral total adrenalectomy for advanced metastatic malignant lesions of the prostate or breast. Such treatment for these conditions has been too recent to permit complete evaluation.

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The Rationale of Prostatectomy and Review of Indications and Technic

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This paper will deal with the rationale of prostatic surgery and a resume of its indications and technics.

INDICATIONS

The indications for prostatic surgery are:

1. Any obstructive uropathy resulting from changes in the prostate gland except acute prostatitis and prostatic abscess, unless resection is necessary to drain the abscess.

2. Any suspected carcinoma of the prostate.

3. Prostatic calculi (possibly with infection and not necessarily obstruction).

In any form of prostatic surgery the criteria of a satisfactory result are that (1) the patient be able to void freely, not too frequently, and to empty his bladder; this implies that no small-caliber urethral stricture be present, (2) that his urine be free of infection, and (3) that complete control be retained.

It must be strongly emphasized that routine physical examination of any man over 40 years of age should include examination of the prostate gland. Rectal palpation of the prostate for possible nodules or fixation is one means of detecting early carcinoma. A firm nodular gland should always arouse suspicion and warrants biopsy and tissue study. A hard, fixed gland demands attention but is usually beyond the early stages of disease and requires palliative therapy. The smooth, freely movable hypertrophied gland is usually not malignant, but no gland should be considered benign until after microscopic survey.

Prostatic surgery is not indicated purely on the basis of urinary obstruction. The urethra, prostate, and bladder should have either cystoscopic and/or x-ray survey before surgery, as the urinary obstruction could be due to bladder or urethral calculi, neurogenic bladder, and so on.

PREOPERATIVE CARE

Proper evaluation and preparation of the patient are of primary importance in prostatic surgery. There is always great controversy regarding various methods of prostatectomy, but more important than the method of surgery is the patient's condition. Prostatectomy is geriatric surgery with all of its many complexities.

Preoperative preparation should include (1) determination of adequate renal reserve, preferably by excretory urography and a complete blood chemistry, (2) estimation of the cardiac and circulatory status and surgical risk, (3) evaluation of the appearance and general condition of the patient (this most important step in preparing the patient should consist of studying the patient's mental outlook and will to live, as well as his physical status; such a personal survey reveals many things that cannot be decided from laboratory tests), and (4) determination of the type of prostatectomy best suited to the individual case.

There are now four types of approach to prostatic surgery, suprapubic, transurethral, perineal, and retropubic.

Suprapubic prostatectomy may be done in one stage or in a two-stage procedure. The suprapubic approach is probably the most popular as it is the easiest to accomplish and is the safest procedure for the average general surgeon who, by force of circumstances, must perform many types of surgery.

SUPRAPUBIC PROSTATECTOMY

Technic of suprapubic prostatectomy has not changed in the past several years; however, the one-stage procedure is now more commonly performed than the two-stage. Present-day facilities for the proper preparation of the patient in regard to renal and cardiac reserve, control of infection, and control of hemorrhage, permit use of the one-stage procedure. There is still much controversy as to whether the procedure of complete bladder closure or that of suprapubic catheter drainage is the one of choice in the immediate postoperative period. It is certainly more pleasant for the patient when all drainage can be handled via the urethral catheter and a complete suprapubic closure made, as it eliminates the sinus or fistula which drains for days or weeks postoperatively. However, the decision for closure depends greatly on the postoperative facilities and whether properly trained personnel is available to maintain adequate irrigation and drainage. In institutions in which urologic surgery is infrequent, suprapubic drainage is the procedure of choice. The suprapubic catheter can usually be removed in 48 hours. The urethral catheter is usually removed in 72 hours following surgery; prolonged urethral catheter drainage may in itself be prejudicial to normal healing.

Recently, placing a pack of absorbable hemostatic gauze in the prostatic fossa has been recommended.[1] If this pack is used, it is imperative that any traction on the urethral catheter be limited, as pressure on the external sphincter may result in atrophy and incontinence. A safer procedure is the use of a wider bladder opening and actual ligation or coagulation of bleeding points.

TRANSURETHRAL RESECTION

Transurethral resection is now well established as a highly efficient method of prostatectomy. This procedure properly done should be called transurethral prostatectomy. It is erroneous to believe that a resection is only to make a tunnel or waterway. The disrepute in which resections previously were held was due to inadequate tissue removal, and unless a complete resection can be done this procedure should not be attempted. Resection is the most technical and difficult procedure of any in urologic surgery to master, and it should not be attempted lightly. Primarily, the operator must be an excellent cystoscopist and then he must develop a routine and rhythm of resection which will permit adequate tissue removal in a reasonable length of time. Inadequate resection leads to prolonged morbidity and persistent pyuria. The one time when resection should be done as a partial procedure is in pros-

tatic carcinoma where extension of the growth precludes complete removal of all malignant tissue by any other type of surgery; in such cases resection alone can give relief.

PERINEAL PROSTATECTOMY

Perineal prostatectomy is considered today to be the operation of choice in early prostatic carcinoma where there is no spread of the malignancy beyond the prostatic capsule. Should this procedure be elected, a radical removal of the prostate and seminal vesicles is indicated. This radical surgery is very mutilating and often results in untoward effects such as severe stricture, priapism, and rectal fistula. However, it is the only approach that affords a complete removal of the prostate. Routine perineal prostatectomy in the hands of a skilled operator has proved quite satisfactory whenever prostatectomy is indicated, but it is a very difficult procedure without well-trained assistants. Furthermore, any perineal prostatectomy creates the potentialities of rectal fistula and stricture formation. On the other hand, it has the advantage of dependent drainage and a low mortality rate.

RETROPUBIC PROSTATECTOMY

Retropubic prostatectomy is the most recent method developed and has proved to be an anatomically sound approach. It has the advantage over suprapubic prostatectomy of leaving the bladder undisturbed. It also affords visibility for good control of bleeding in the prostatic bed, and in addition there is complete suprapubic closure. Hemorrhage of the venous sinuses of the anterior prostatic capsule can be a troublesome complication during surgery. An obese abdomen and/or a narrow pelvis can also cause difficulty in the retropubic approach.

CHOICE OF PROCEDURE

Of the four approaches to prostatic surgery, the transurethral resection is the procedure of choice when done properly and with adequate tissue removal. This procedure leads to a lower mortality, lower morbidity, and a shorter period of hospitalization. Either suprapubic or retropubic prostatectomy would be second choice. The retropubic type is anatomically a more sound procedure, but the suprapubic is an easier procedure to master and has the previously mentioned advantages. Perineal prostatectomy is the procedure of choice in early carcinoma.

RESULTS

With improved surgical technics and with the necessary appreciation of the proper preoperative preparation of the patient, the mortality rate in prostatic surgery is now very low. Probably the greatest factor in reducing mortality and morbidity is the use of blood transfusions before, during, and after surgery as necessary. In my surgical practice, I have almost routinely used whole blood transfusions during any type of prostatectomy. This has led to a great decrease in shock reactions and to a much more rapid postoperative recovery period even in the cases of very poor risk. Mortality in prostatectomy for benign hypertrophy is 4 to 5 per cent for the suprapubic procedure, 2 to 3 per cent for the perineal, and, in transurethral resection, 1 to 2 per cent.[2] In addition to lower mortality, there is a significant decrease in the postoperative hospital period. A survey of the prostatic cases which I have operated on over the past 3 years shows an average postoperative hospitalization of 8 days for cases of one-stage closed suprapubic prostatectomy and of 6 days for resections. An interesting sidelight is the record of the amount of tissue removed at surgery. There was an average of 60.6 grams for the suprapubic and 21.2 grams for the transurethral procedure.

POSTOPERATIVE CARE

When the operation of prostatectomy has been performed, only a portion of the task has been accomplished. Thorough aseptic technic must be followed in all postoperative care including use of sterile flasks, tubing, collecting bottles, and the like. Antibiotics have greatly decreased complications due to infection but their use does not obviate the necessity for aseptic precautions.

It is most essential that the postprostatectomy patient be seen regularly. Beginning about 3 weeks after surgery, the urethra should be gently calibrated with sounds to determine the presence of any stricture formation. Weekly soundings should be performed for several weeks to assure proper urethral capacity and to maintain elasticity and prevent heavy scar formation in the enucleated area. The latter is the most important part of postoperative care. The urine should be observed closely for pus and necessary measures taken to control infection. Temporary urinary incontinence may occur which is often due to preoperative atrophy of disuse resulting from the obstructing prostate acting as a barrier and the external sphincter not being used. Frequent soundings and sphincter exercises will usually correct this condition.

In summary, the care of prostatic obstructions consists of very meticulous preoperative preparation of the patient, choice of the proper method of prostatectomy to suit the individual case, and a very careful and planned postoperative management which should extend well beyond the patient's discharge from the hospital.

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Symposium

Civil Defense—Major Disaster

Amputation Following Trauma

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Bailey,[1] at the beginning of the last war, wrote: "An amputation rendered necessary by war injuries may be an entirely different proposition to a planned operation in times of peace. Bullets, bombs, shells, torpedoes and mines have no respect for anatomy, and the surgeon is faced with problems requiring promptitude, originality and skill."

CIVIL DEFENSE NEEDS FOR SURGEONS

The contemporary role of the civilian surgeon in preparation for potential disaster is cast for him by civil defense authorities when they make plans for treatment of casualties and prevention of epidemics. The controlling circumstance is the certainty that warfare will be atomic. Casualties will be civilians. The main problem is the magnitude of the disaster, the sheer volume of casualties.

Planning experts[2] describe the probability thus: A surprise daytime attack on a large city with an average population density will result in 120,000 casualties, one third of whom will be killed outright, and two thirds of whom will need medical attention. To evaluate the seriousness of their need, they point out that of these 120,000 casualties, in all probability 20,000 will not survive 6 weeks. From a country-wide average of physicians in relation to average population they estimate one physician will survive for every fifty casualties. The doctor's usual duties suddenly will be expanded by fifty emergencies. Apropos of the function of the surgeon is the estimate that one third of the casualties to be treated, or 40,000 people, will have mechanical injuries.

In Japan, the types of injuries among atomic bomb survivors were blast and radiation wounds and burns, the latter constituting the major group. The most damage, in civilians killed and injured and in buildings destroyed, was suffered a mile from the center of the explosion, and the outer limit of damage was 4 miles from center. The range for mechanical injuries from the center of the blast may be from 12,000 feet for a bomb of the equivalent of 20,000 tons of TNT to 25,000 feet for a bomb the equivalent of 160,000 tons of TNT. The force of the blast is dependent upon the height at which the explosion occurs. Thus, it can be readily seen that facilities for treating trauma are imperative.

The planners state that the number of casualties can be cut in half if the populace has warning of the attack and if the citizenry has been well instructed and responds with discipline.

The well-organized community, knowing itself a potential target area, has designated buildings to be used as hospitals, made floor plans with the necessary alterations and the areas of specific activities blueprinted, planned its clinical and administrative staffs with alternates to assume authority depending on survivors, established the duties of personnel, procured drugs and equipment or set up a supply line, and established relationships with an existing hospital and with all other civil defense authorities. Within these temporary hospitals must be receiving and sorting teams, shock and recovery teams, surgical-dressing teams, and operating teams. This background has been sketched briefly to indicate that meeting the disaster may mean that the physician finds himself serving as a member of a team for which he is the best-qualified survivor.

The general importance of amputation following trauma may be gathered from these figures on incidence: Men who lost limbs in the Civil War numbered 50,000; 4,400 amputees survived World War I; more than 17,000 combatants in World War II had one or more extremity amputations.[3] In the civilian population, in 1948, 20,000 had amputations following trauma from automobile accidents, industrial disasters, or other emergencies.

CONSERVATIVE APPROACH

Amputations becomes a surgical necessity when any injury occurs to the limbs so severe that the tissues —bones, vessels, or nerves—cannot be treated any other way. Thorek[4] emphasizes the fact that the surgeon should not be in a hurry to amputate in the young and robust patient no matter how ominous the case appears. The rapidity with which such patients recuperate from extensive injuries is amazing, and the restoration of complete function and usefulness to limbs which, at the time of injury, seemed beyond repair is almost unbelievable. In these cases patience often has better results than the most brilliant surgery. The judgment of the surgeon must be guided by the kind of postoperative care which can be supplied.

Primary amputation is performed prior to the development of shock or after shock is controlled, and before sepsis can set in. If no more than 8 hours have intervened since the injury, the surgeon may proceed. Olsen[5] in a survey of 560 amputees in Korea fixes the time limit at 24 hours, provided the patient has had the benefit of controlled antibiotic treatment. Vasconcelos[6] considers it best to operate if treatment against shock is ineffective and shock becomes progressively more serious because sometimes the life of the patient can be saved. Operative shock is always a hazard. The higher or more central the amputation, the greater the possibility of shock. Spinal or Pentothal anesthesia helps to abort shock and has been found superior to inhalant anesthesia in this phase of surgery.

LEVEL OF AMPUTATION

A conservative attitude is essential. Too low an amputation can be repaired later. If the removal is too high, nothing can be done subsequently. Any functioning part of a limb is superior to any prosthesis, and this is particularly true of the hand. The level of amputation also depends upon the age of the patient; if growth has ceased, more leeway is possible.

Watson-Jones[7] presents the following optimal and minimal length figures: for upper arm amputation stump, 8 inches optimal, 5 inches minimal; for forearm stump, 7 inches optimal, 3 inches minimal; for thigh

stump, 10 inches optimal, 6 inches minimal; for below-the-knee, 5½ inches optimal, 3 inches minimal.

In general, although the makers of artificial limbs outline what they consider ideal sites of amputation, as Bailey[1] says, they can devise other suitable and ingenious parts in addition to their standard pieces; therefore, the surgeon should seek to preserve what can be saved. Several types[8] of prosthesis which were developed for amputees of World War II and which have proved worthy are: a prosthesis for carpal-metacarpal disarticulation, which allows pronation and supination of the forearm and dorsal and palmar flexion of the wrist joint; various cineplastic procedures which permit limited use of the forearm; the Northrop wrist joint; the Fitch elbow; a prosthesis for the Syme stump, which makes this serviceable stump more favored; a prosthesis, for the patient who can manage knee motion, which shifts weight bearing to the ischial tuberosity; and a suction-type socket, which is the best of its kind so far developed.

NERVE ENDS

For many years proper nerve technic was a much debated subject. Thorek[4] and many others recommended that severed nerves be injected with alcohol or a local anesthetic, pulled out about an inch, and ligated. Watson-Jones,[7] to mention one of many, objected to this treatment for the main nerves of the limb. One of the benefits from observations of amputations in World War II and the Korean conflict was the resolution of this debate.

Slocum[9] describes the procedure:

> Nerves should be isolated, pulled down gently, sectioned cleanly with a single stroke of a sharp knife, and allowed to retract upward into a bed of normal healthy tissue so as to lie one inch above the bone end. Pain arising from peripheral nerves has its origin in intraneural scars, or extraneural scars, which, once established, may affect the nerve either through tugging and pulling upon the sensitive nerve end, or by strangulation of the nerve in scar tissue. Strong traction, rough handling, or chemical infiltration of the nerve are common causes of intraneural cicatrix; placement of the nerve end in a bed of scar tissue will lead to fixation. Painful neuromata and phantom limb pain are less likely when the nerves are treated by a simple section than when they are injected with sclerosing solutions, closed by a plastic technique, or buried within the bone. Large nerves like the sciatic may be ligated when they contain an accompanying blood vessel.

A more recent solution of this problem which I have found very satisfactory is transplantation of the nerve in a reverse direction in the belly of a convenient muscle.

GENERAL OBSERVATIONS ON TECHNIC

Hemostasis should be satisfactory before amputation is begun. If pressure is released before the flaps are sutured, the possibility of hemorrhage through an accidentally untied ligature can be checked. Provision should be made for the drainage and escape of serum. The stump needs a good blood supply, and the amputation must be high enough to insure it.

Soft tissues are retracted, the bone is sectioned transversely with a sharp saw which is cooled as it is being used, and the bone end is filed smooth, the tissues being protected from bone dust by retractors or a three-tailed bandage. Periosteal flaps are not considered desirable, nor are muscle flaps in general, although muscles should not be permitted to retract. Bursa, if encountered, should be excised, since postoperative inflammation of a bursa, which can persist chronically, is difficult to treat and cure.

The stump is dressed in gauze with several superimposed layers of wool held firmly in place to promote shrinkage, and the whole is encased in plaster of paris. Drainage should be assured, unless the wound is clean. Kessler,[10] in summarizing lessons learned in World War II, stated that because of frequent hemorrhage and formation of hematomas, drains were found to be necessary. Watson-Jones[7] advises leaving the stump at rest for 2 to 3 weeks, because early handling increases the tendency to phantom limb.

The surgeon should strive to make a firm, conical, painless stump. To this end, he should avoid stretching and tension of flaps, allowing enough tissue for retraction of muscle and skin, especially near the joints. Nerve ends should not be included in the scar. Skin flaps can be trimmed if loose tissue persists later. It is best if the flaps are circular, with combined lengths exactly equal to the diameter of the limb.

On the arm, a terminal cutaneous scar is sufficient. A posterior scar is better for the lower extremities, since there is always pressure on the end and the prosthesis causes friction on the front of the stump.

The type of amputation most often used in life-and-death military or emergency traumatic surgery is the guillotine amputation. This is performed, after tourniquet or preliminary ligation, by a clear cut through the limb with a circular sweep of a large knife. The bone is sawed at this same level. No skin or muscle flaps need be made, although, if time allows, large muscle flaps can be drawn together and sutured and provision made for drainage. If the patient survives, secondary amputation follows. Skin traction with balanced weights prevents unnecessary shortening of the stump because of retraction. Ryan and his associates in the Navy[11] reviewed 769 patients with a total of 829 amputations, 757 of which were performed following trauma. Of these, 570 were done by a guillotine technic, 45 by open-flap, and 214 by primary closure. Amputations of the upper extremity were necessary in 261 or 31.5 per cent and of the lower extremity in 568 or 68.5 per cent.

HAND

In an amputation of the hand, the surgeon should think of wound excision or débridement before amputation, especially in that most important portion of the hand, the thumb. Two thirds of the functional value of a hand lies in the thumb. Any part of it is worth saving. If disarticulation of a finger will arrest infection and protect the remainder of the hand, the loss of function of that finger is the lesser of the evils.

For total removal of the index or little finger, a racquet incision is made to form a large lateral flap on the outer side for the index finger or the inner side for the little finger. For the former, the large flap extends almost an inch distal to the metacarpophalangeal joint. The racquet is completed by encircling the base of the finger with an incision through the interdigital cleft, and the disarticulation is completed. For the middle and ring fingers, a simple racquet incision is made to the bone with the handle beginning over the distal third of the dorsal surface of the metacarpal bone and drawn downward and forward around the finger on both sides and through the palmar crease. The tendons are tensed and divided and the finger hyperextended; the joint capsule is incised from its inner surface, and the lateral ligaments cut. If the finger can be preserved to the second joint, a racquet incision or a long palmar flap can be used. The joint is cut opposite the crease on

the palmar aspect and a little distal to the knuckle on the dorsal aspect. The extensor and flexor tendons are divided and stitched together over the head of the first phalanx to maintain full movement of the stump. The skin flaps are sutured. If the amputation includes only the terminal phalanx, insertions of the flexor and extensor tendons should be spared.

Amputation through the wrist joint, though rarely indicated, can be done when none of the hand can be saved and enough skin is available for some flap construction. The tendons are divided slightly below the level of the joint line and the joint is disarticulated from the radial aspect. I have found amputation through the wrist joint objectionable since it is impossible to obtain a satisfactory functional prosthesis because of the bulblike enlargement of the radius.

UPPER EXTREMITY

For amputation through the forearm, the arm is extended and either pronated or supinated. Skin flaps are short, circular modifications, fashioned from any available site. The muscles are divided and the interosseous membrane is cut. Radius and ulna may be cut at the same time, while the arm is supine; or they may be cut separately, the radius first, while the arm is in midposition. To prevent uniting of radius and ulna, the muscles, front and back, should be drawn through between the bones and sutured. This guarantees maintenance of pronation and supination.

If amputation through the elbow joint is preferred, the arm is abducted and flexed to an angle of 130 degrees. The projections of the condyles are covered by a large internal and a short external flap, made by a short vertical incision in the groove to the inner side of the prominence of the biceps tendon, exposing the brachial artery and median nerve which are divided and tied, after which the incision is curved downward, backward, and then up to the base of the olecranon process. The skin and fascia are lifted a half-inch and the knife inserted to the bone. The same method is used for a very short external flap. The triceps tendon is divided, the radiohumeral articulation defined and opened, and the disarticulation carried out.

For amputation through the upper arm, the arm is held in abduction for the anterior incision and vertically for the posterior incision; small skin flaps in front and back are prepared; the muscles, first the triceps behind and then the biceps in front, are divided circularly to the bone and retracted; the deeper muscles are divided and retracted, and the bone is cut. A tourniquet is used, unless the level of the amputation is too high. In this eventuality, the vessels and nerves must be exposed and cut with a racquet incision.

For amputation at the shoulder joint, the arm is abducted and rotated outward, skin and fascia are incised from the coracoid process down to the lowest end of the anterior axillary fold, then outward over the deltoid to the posterior axillary fold, and circled in and frontward to join the first vertical cut. The inner flap is reflected. The tendon in the pectoralis major muscle is located and divided. The pectoralis minor muscle, close to its point of attachment to the coracoid process, is divided. Axillary vessels and nerves are ligated and separated. The external skin flap is reflected, the deltoid cut to the bone, and the whole portion lifted to lay bare the joint. The humerus is turned inward to tense the supraspinatus, infraspinatus, and teres minor muscles, which are divided, and when the humerus is in external rotation, the subscapularis tendon is cut. The two biceps heads are incised to the fore of the joint. A cut is made into the capsule and the head of the humerus dislocated forward. It is best to divide the humerus at the anatomic neck so that the head remains in place.

LOWER EXTREMITY

Kessler[10] described four basic amputations of the lower extremity as those used most frequently in World War II: Syme's at the ankle, below-the-knee amputation, Stokes-Gritti's, and above-the-knee amputation. He states that in injuries other than malignant infection, for which guillotine amputation was used, the procedure was as follows:

> A circular incision was made through the skin and fascia at the most distal point of viable tissue. The flap was turned back as a complete cuff for about three inches. With a large amputation knife the remaining muscles were cut through as in the true guillotine amputation. The periosteum was incised at the level avoiding the stripping of the bone. The large vessels were double ligated with chromic gut, the nerves sharply divided without manipulation or injection and allowed to lie free in the intermuscular planes. The cuff of skin and fascia was then allowed to cover the open end of the stump and skin traction with moleskin strips was applied. By the procedure the healing period was shortened from six to eight weeks to two to three weeks. The skin closed rapidly so that skin grafting or wide excision of the scar at the time of revision was unnecessary.

Feet.—

Function of the foot is not affected much when the four outer toes are amputated, as long as the heads of the metatarsal bones are left. Weight bearing is dependent upon the first metatarsal bone and that part of the big toe should be saved, if possible. Disarticulation of a terminal phalanx of the toe is performed like the comparable operation on the finger, except for flap dissection and opening of the joint, which, for the toe, is done on the plantar side. The same flaps for amputation at the metatarsophalangeal joints as at the comparable point in the fingers are recommended. The surgeon should remember that an internal flap must have sufficient dimension to cover the large metatarsal bone of the great toe. Amputations through the tarsal bones are rarely used. Dorsal and plantar flaps fastened over removed portions of the metatarsal bones leave a serviceable stump for which no prosthesis is needed. If the foot has been rendered useless, Syme's amputation may prove superior if the integument surrounding the heel is not injured.

For Syme's operation, the foot lies over the end of the table and is held, raised, and lowered by an assistant who faces the surgeon. An elliptical incision is cut 1 inch in front of the heel, anteriorly across the front of the ankle, inclining slightly upward, and posteriorly behind the tip of the internal malleolus, crossing the sole to a point ½ inch above the tip of the external malleolus. All the tissues are incised to the bone, and the ankle joint is opened. The lateral ligaments are divided, the foot depressed, and the astragalus dislocated. The foot is depressed farther and the Achilles tendon and heel flap are cut from the os calcis, with the knife in close contact with the bone, so that the termination of the peroneal artery on the lateral aspect and the branch of the tibial artery on the medial aspect are unimpaired. These vessels enter the heel flap and must be preserved. The foot is removed, and the tibia and fibula are sawed ¾ inch above the level of the joint. The anterior tibial blood vessels and the internal saphenous vein are ligated. Nerves are divided and reimplanted in a reverse direction in the intermuscular spaces. The plantar vessels are tied. The large pos-

terior tibial nerve is cut a little higher than the end of the bone. Tendons are shortened if necessary. Lateral drainage, at either end of the flap, is instituted for 24 hours.

Below the Knee.—

Kessler[10] described a good standard operation below the knee as follows:

> . . . the patient is placed on his face. Slightly unequal flaps are made with the anterior flap somewhat longer. The flaps are reflected and held in place with a single suture to avoid handling and retraction. The muscles are cut through somewhat obliquely in order to secure a graduated conical stump with a large knife. The interspace between the fibula and tibia is also cut through with the same knife. The tibia is incised in a circular manner and the periosteum stripped distally and sawed through. The fibula is treated in the same manner but is cut one inch shorter using a Gigli saw. The anterior crest of the tibia is bevelled. The nerves are carefully isolated, cut sharply and allowed to fall back into their intermuscular spaces without unnecessary traction, or manipulation, injection or other handling. The large vessels are seized, clamped and tied and the tourniquet removed. The remaining bleeding is controlled by pressure and hot laps or by electrocoagulation if available. The skin flaps are closed with interrupted sutures and drains inserted for forty-eight hours.

The Stokes-Gritti amputation at the knee joint utilizes a long anterior flap of the patella and all tissue to the joint and a short posterior flap of 2 or 3 cm., the incision starting across the tubercle of the tibia. Hamstring muscles are divided above their insertions. The patella is reflected, and the articular surface removed with a saw. The synovial membrane is excised. The femur is sawed at a point above the condyles where its diameter approximates the size of the patella, which is sutured in apposition with interrupted catgut through the trimmed fascia. The hamstring muscles and patellar ligament are sutured. The gracilis, sartorius, semitendinosus, and semimembranosus muscles and the biceps on the opposite side are measured and cut and sutured to the patellar tendon, where they counterbalance the quadriceps extensor. The success of this amputation requires that the patella be firmly fused to the femur so that no tilt or lateral displacement will develop. The stump presents an excellent weight-bearing surface.

LOWER THIGH

If amputation through the lower third of the thigh is preferred, a U-shaped anterior flap is cut, its length slightly less than the anteroposterior plane of the limb after the bone is cut. This flap is raised and the quadriceps tendon cut and reflected. The posterior incision traverses the skin and fascia of the popliteal space to the ends of the frontal flap. All muscles are cut transversely to the bone, vessels are ligated, and nerves cut. The two popliteal and long saphenous nerves should be tied. The femur is cut 2½ inches above the knee joint. Muscles are sutured together over the bone with the suture line on the posterior and the bone lying in the center of the muscular flap.

MIDTHIGH

If the midthigh level is chosen for the amputation, an elliptical incision is cut with the highest point lying on the posterior surface, where the bone is to be cut through, and the lowest point in front, 6 to 8 inches down. A 3-inch skin flap on the front of the thigh is lifted. The knife is sloped through the muscles to the bone at the level where it is to be sawed in such a way that the amount of muscle for the flap increases. At the back of the thigh the skin is raised, the muscles are cut through to the bone and retracted, and the bone sawed. When the vessels have been secured, the tourniquet is released and the muscles are sutured over the bone with mattress sutures.

Bailey[1] advocates a sleeve operation for amputation through the thigh, when the femur has been fractured and the risk of surgery is extreme, because the bone need not be divided and shock is lessened appreciably. The operation consists of a circular amputation with separation of the soft-tissue attachments with the knife and Jones' gouge until the lower segment of the limb can be withdrawn by rotary movements with a heavy bone forceps. The sleeve is left open and is filled with gauze.

HIP JOINT

For some few casualties amputation through the hip joint, despite the dangers and frequent fatalities, may be the only surgical choice. The stump from this amputation is the pelvis covered with skin and subcutaneous tissue, unless the femoral head and a portion of the neck can be left, which makes the fitting of a prosthesis much easier. The patient is placed with his buttocks on the edge of the table with both legs projecting, but the good one is abducted and fastened securely. The incision begins at Poupart's ligament and runs vertically 3 to 4 inches down the line of the femoral vessels, which are then exposed and ligated as high as possible.

The surgeon carries the incision obliquely around the inner side of the thigh about 4 inches below the perineum, then outward to a point below the base of the great trochanter, then across the back of the thigh to the origin of the incision. All along the line of the incision, skin and fascia are raised and the muscles on the outer side of the thigh are cut to the bone. The external circumflex artery is tied. The leg is lifted, so that the attachments of the gluteus and of all the muscles appended to the great trochanter can be severed. Muscles behind and in the adductor region are so treated, and the internal circumflex artery is located and ligated. All muscle and periosteum are cleared from the femur, the most difficulty being encountered along the linea aspera. The joint is opened from the front, the head of the femur is dislocated from the acetabulum, and the ligamentum teres and remnants of the capsule are severed.

CONCLUSION

In utilizing the various possible type of amputations, the surgeon will apply all the judgment and all the technic at his command, depending upon his own ingenuity to meet the crisis, if trauma is imposed upon great numbers of people who must be treated quickly. Basic types of amputations have been described here.

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Care of Abdominal Injuries

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Abdominal injuries may be classified as penetrating or nonpenetrating.[1] In military activities a predominance of the penetrating type would be expected. In civilian life the two types are found to occur almost equally in number.[2] Variations may be expected in catastrophe.

Therapy of abdominal injuries consists of, first, the alleviation of shock, and, second, the indicated surgical intervention. The injured have experienced considerable blood loss in many instances. It is best to start saline intravenous infusion[3] and then progress to plasma as soon as possible. This may support the patient until the correct type and amount of blood can be obtained. In cases of minimal trauma and impending shock, saline infusion, sedation, and close observation may be all that is required. More severe trauma requires sedation, plasma, and transfusions in quantity sufficient to obtain circulatory stability.

During application of supportive care in nonpenetrating wounds, it is mandatory to obtain a careful history and information relative to the particular type, direction, and strength of the blow. This information is of prime importance in attempting to evaluate the need for surgery. Careful physical examination is necessary to observe specific points of pain and areas of splinting. A silent abdomen indicates the probability of continuing hemorrhage or spilling of gastric, intestinal, or bladder contents into the peritoneal sac.

It is also necessary to observe orifices for presence of blood or absence of normal product. In suspected injury of the large intestine, proctoscopic or sigmoidoscopic examination may be indicated to look for blood or wounds in the observable areas. Urine should be examined for the determination of volume and for the presence of blood. Absence of urine may indicate disruption of bladder, kidneys, or ureters. Careful notation of increasing abdominal distress and spreading rigidity should be made.

X-ray examination of the abdomen with the patient in the upright position (with due consideration for the patient's state of shock) should be done to determine the presence or absence of air under the diaphragm, indicating a penetration of a hollow viscus, stomach, or intestine. If a large amount of blood or other fluid is being lost from an intra-abdominal structure, a roentgenogram may indicate pooling of blood or fluid in the pelvic area, giving a clue to necessity for surgical intervention.

In wounds of the penetrating variety, probing and digital exploration must be avoided. It is not wise to use packs to contain arterial bleeding; the best procedure is to clamp and tie presenting points of hemorrhage, which may facilitate correction of the shock picture. Probe examination of abdominal wounds may be done in the operating room where preparation is made for surgical exploration.

In any case of penetrating wound of the abdomen or where there is suspicion that a hollow viscus has been ruptured, a gastric or intestinal drainage tube should be installed to decompress the stomach. This helps to prevent further loss of intestinal content into the abdomen and regurgitation and aspiration of material which might complicate the anesthetic procedure and cause the death of the patient who might otherwise survive. Any patients suspected of having material in the stomach, which might be regurgitated during anesthesia, should have a gastric drainage tube placed.

Surgical care of abdominal wounds should be undertaken whenever reasonable doubt exists regarding damaged structures. The surgical approach is determined by localizing signs. In most instances the right or left paramedian or rectus incision may be extended up or down to obtain adequate exposure of the traumatized areas. Where possible, the incision should include the area of penetration. If the peritoneum has not been perforated, it may not be necessary to open the abdomen. If the peritoneum has been penetrated, the abdomen should be opened and a careful exploration done. During abdominal exploration all obvious vascular injuries, including the mesenteric arteries and veins, lesser and greater omental vessels, liver and spleen, should be repaired first, to decrease the shock tendency. Survival time is often too short to permit repair of damaged great vessels. Splenic rupture necessitates extirpation.[4] Procrastination by attempting to repair small ruptured areas invites death by delayed hemorrhage. Liver rupture requires heavy mattress sutures to close major defects, using such aids as omental tampons or absorbable packs to support suture lines. When all vascular injuries are controlled by suture-ligature, careful examination of the gastrointestinal, biliary, and pancreatic systems should proceed.

The gastrocolic omentum may be opened to explore for posterior perforation of the stomach. Rents and perforations of the stomach should be closed by the routine layer method. Injuries to the pylorus or duodenum may require gastroenterostomy in association with repair of the defects. Injuries to the gallbladder may require cholecystectomy or repair of the gallbladder with drainage. Common duct injuries may require anastomosis or repair in the usual manner using a T-tube or catheter splint. Pancreatic injuries are a likely occurrence. The capsule and gland should be repaired and drainage established.[2] Fistula may occur but usually closes in time. Mesenteric trauma or intestinal trauma with perforation may yield variable areas of traumatized or devascularized tissue. Small areas may be repaired in the usual manner by layer closure, with due care to prevent narrowing of the lumen and secondary intestinal obstruction. In areas of questionable reparability or viability, intestinal resection with end-to-end or side-to-side anastomosis is to be preferred. All mesenteric defects should be repaired to prevent the possibility of internal herniation.

Injuries to the large bowel present special problems of contamination. The bowel should be carefully explored. Mobilization of areas with fixed mesenteric attachments or retroperitoneal placement should be undertaken if reasonable doubt exists as to integrity of the segment. Small areas of injury may be closed in layers and proximal colostomy established. Larger areas of damage may require right or left hemicolectomy. Rectal injuries sometimes require proximal colostomy and pararectal drainage.

Other structures which may be injured include kidneys, ureters, and bladder. Most injuries to kidneys and renal pelvis yield to simple suture closure and adequate flank drainage. Ureters may be repaired in the usual manner and extraperitoneal drainage established. Bladder perforations and tears are repaired by layer closure and drainage established. Drainage is a prime requisite in abdominal trauma problems.

Postoperative care includes gastrointestinal decompression by gastric drainage or intestinal drainage tubes until continuity is proved. Adequate transfusions are needed to maintain blood volume and proteins for healing. Parenteral fluids with electrolytes are necessary to replace fluid and electrolytes lost through intubation, drainage from established fistulae, urination, and insensible fluid loss. Antibiotics or chemotherapeutic agents should be administered in accordance with standard practice and judgment of the surgeon. Culture identification of contaminants should be done. Early ambulation, another application of the osteopathic concept, facilitates circulation and healing, thus shortening the convalescence period.

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Ocular Trauma

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If we are called upon to treat a great number of injured people in a limited time as in case of a bombing attack or other great emergency, it would be well to have a few basic principles in mind of what to do and, sometimes more important, what not to do.

Eye injuries may be classified as (1) injuries from solid bodies, which include superficial and deep abrasions and foreign bodies; lacerations of the lids, conjunctiva, cornea, and sclera; and contusions of the orbital rim or the eyeball itself; and (2) burns, which may be thermal, chemical, or radiation burns.

From statistics gathered in the recent war about 80 per cent of ocular injuries can be completely handled by the initial emergency treatment. The remaining 20 per cent need to be treated by an ophthalmologist. In injuries caused by foreign bodies, which comprise the greatest number of injuries, the following routine is very satisfactory.

First, a brief history is obtained to determine the nature of the injury. Then after gross debridement, topical Pontocaine 0.5 per cent should be administered in the amount of 3 or 4 drops. *Cocaine should not be used* because of its softening and damaging effects to the cornea. When the patient is free of pain the extent of injury should be determined and a decision made as to whether the injury is one of the 80 per cent to be handled by first aid or one of the 20 per cent requiring the care of an ophthalmologist. If the injury involves deep lacerations of choroid or iris or vitreous spill or presents evidence of perforating injuries, the eye should be bandaged and the patient referred to an ophthalmologist after being given adequate doses of penicillin or other antibiotics and sedation or treatment for shock as indicated.

If the above-mentioned conditions do not exist then the entire area should be cleaned thoroughly with green soap, flushed with 1:5,000 solution of bichloride of mercury, and more Pontocaine administered. By this time the area will be clean and the patient relatively free of pain. A wet swab will be adequate to remove protruding corneal objects and conjunctival foreign bodies.

If a large abrasion or extensive corneal damage exists, atropinization is necessary. If at all possible this should be left to the discretion of an ophthalmologist because of the danger of subsequent glaucoma, particularly in older people. Corneal damage more often causes permanent eye injury than all other ocular trauma combined. Foreign bodies in the cornea should be removed with a spud or a hypodermic needle being held as a spud. Foreign bodies should always be removed from below upward. There is good reason for this, for an involuntary movement of the eye while the operator is working is always in an upward direction. If one is working from above downward such an involuntary upward rotation can be greatly damaging by forcing the eye into the probe, whereas, when working from below upward this same involuntary motion simply pulls the eye away from the cutting instrument. It is not wise to attempt immediate removal of a rust ring remaining after the removal of a corneal object as it causes excessive corneal damage unnecessarily. After 24 to 48 hours the ring will usually disappear, and if it still remains, careful local application of trichloracetic acid on a swab will soften and remove it.

Perforating injuries of the eye carry a very great risk to the preservation of sight in the damaged eye. Perforations are caused by glass, wood, magnetic iron, and other metals. To avoid encapsulation perforating bodies must be removed early, which means anywhere up to 24 hours. Some items are tolerated better than others. Glass is tolerated best of all. Sometimes iron can be tolerated. Because of their electrolytic action on body tissues copper and brass are never tolerated and must be removed even if it requires removal of the eye.

Chemical injuries and burns, which include all those caused by chemicals, plaster, acids, alkalis, et cetera, comprise a great number of ocular accidents. The treatment is outlined as follows: *Do not neutralize* the chemical agent responsible for the burn. This practice is obsolete and dangerous. The speed of initial care is most important, and even seconds count from the time of the initial injury. Irrigate with copious amounts of water in a bucket or eye bath, or any manner to get the water in generous amounts in contact with the eye. Then Pontocaine should be instilled, and I again emphasize that *cocaine should not be used* because of its damaging effect on corneal tissue. After Pontocaine instillation the eye should again be irrigated, with boric

acid solution if possible. If this solution is not available, normal saline or plain water should be used. After irrigating generously for about 10 minutes, the cornea should be stained with fluorescein. If the cornea takes the stain it means there is damage. A search should be made for any foreign debris and any found should be removed carefully. The eye should be atropinized. The use of ophthalmic Hydrosulphosol has had a great deal of publicity in recent years and still more recently the value of it has been questioned. However, in my own experience, I have had good results with this preparation and will continue to use it until something better is available. It is applied to the burned area and a pressure bandage placed over the eye, which should be redressed every 24 hours. In the past year ophthalmic Hydrocortone has come into active use. It is very effective alone or in conjunction with Hydrosulphosol. Even a severe corneal burn treated adequately and early will heal in 48 hours with the type of treatment I have described. If there is corneal damage that fails to heal in 48 hours a conjunctival flap should be elevated and placed over the burn to protect the corneal tissue.

CONCLUSION

As in all cases of trauma, skillful management of eye injuries begins with careful diagnosis of the problem presented. The simplest method of treatment that is adequate is usually the best. Many permanently damaged eyes are due to overzealous treatment at the time of injury.

I hope these comments will be of value in case we are required to administer emergency treatment after bombing attacks or other disaster.

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Penetrating and Concussion Injuries of the Chest

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Penetrating and concussion injuries of the chest may be divided anatomically into extrathoracic and intrathoracic involvements. The former requires no extensive treatment except that which might be given to similar injuries elsewhere on the body. However, it must be kept in mind at all times that even with comparatively minor external wounds, extensive internal damage can be present. In general, it may be said that in any case where the symptom picture of a chest wall wound is completely disproportionate to the injury, chest content involvement should be suspected and the treatment procedure carried out accordingly.

Penetrating wounds may be classified as those produced by bullet, shrapnel, knife, bayonet, or flying debris; occasionally fractured ribs can be placed in this category. Concussion of the chest is as a general rule produced by direct external trauma or by the sudden air expansion which accompanies explosions. The first type, if accompanied by extensive rib fractures, is termed a crush injury. The latter type is termed a blast injury and often occurs with no external signs of injury. Because of the lack of external evidence, this latter injury is the most dangerous type encountered and may involve not only the rib cage itself, but also all or part of the thoracic viscera. It is in these cases that the symptom picture is out of proportion to the external findings.

DIAGNOSIS

The findings, excluding those of pain and external bleeding, are disturbances of cardiorespiratory function, usually present in direct ratio to the severity of the injury. Generally, the patient is in a state of shock and is likely to be unconscious, thus placing the entire burden of differential diagnosis upon the examiner. His success will depend upon his knowledge of physiologic diagnosis and of the anatomic relationships of the thoracic viscera and cage.

If there is no specific cardiac injury, the symptoms are initially those of pneumonia combined with those of pneumothorax, hemothorax, or hemopneumothorax. These include dyspnea, cyanosis, diminished or absent breath sounds and chest excursion, dullness on percussion, and possibly bloody sputum. Variable emphysema is also noted. It is often possible to determine the fluid level by auscultation or percussion and, with an open wound (open pneumothorax), detect the so-called "sucking wound." Palpation will disclose the flail chest resulting from multiple rib fractures. Should air or blood continue to accumulate after complete lung deflation (tension pneumothorax), the mediastinum will be displaced, the opposite lung and the heart will be compressed, and anoxia will result which, if not relieved, will end in death of the patient. The open pneumothorax if allowed to continue produces a pendulum movement of air, which tends to move the heart and mediastinum from side to side resulting in the so-called mediastinal flapping. This also produces cardiac insufficiency and severe anoxia.

If cardiac damage is present and the pericardial sac is untorn or the laceration plugged, percussion gives evidence of hemopericardium or cardiac tamponade and such signs as severe dyspnea, cyanosis, and lividity are produced. Abdominal rigidity sometimes occurs even when the abdomen itself is not involved. With cardiac laceration or tear, auscultation shows muffled, unusual, or distant heart sounds, and it is said that occasionally the blood can be heard to spurt at each cardiac systole. In all cases the pulse volume is diminished and is usually rapid, feeble, and irregular;

to put it simply a picture of shock is present. The shock picture in heart injuries is, as a rule, more profound than in respiratory damage alone. However, it may be stated that in most severe chest trauma, cardiac and respiratory damage or malfunction is coexistent.

MANAGEMENT

In the immediate management of thoracic injuries, the timely application of a few simple first aid measures will often determine whether the patient will live or die. The measures comprise controlling external hemorrhage by firm pads and strapping; sealing of open pneumothorax with an occlusion pad, vaseline gauze, and strapping; immobilization of flail chest by means of firm strapping around the affected hemithorax; or relieving tension pneumothorax by aspirating the contents with a needle. Oxygen will be required by the majority of patients and it is important to see that it is supplied efficiently and sufficiently. Sedation in the form of morphine sulfate or Demerol in sufficient dosage should be given and repeated as necessary, as relieving pain and anxiety is mandatory for the general well-being of the patient. However, in the presence of cyanosis or bronchial secretions, extreme caution should be observed in the use of both of these drugs.

Transfusions of blood or plasma are always required, and it has been proved that there is little danger of overloading the circulation and producing pulmonary edema if they are given cautiously. The exception to this procedure is in blast injuries. Patients with blast injuries should not be given transfusions, except in cases of massive blood loss, because transfusion has been found, through experimentation, to increase preexisting pulmonary petechial hemorrhages.

Bronchial aspirations should be employed in all cases where the natural cough mechanism does not effectively remove secretions.

In regard to transportation, a patient with a chest injury usually travels better within the first 24 to 36 hours than later. In other words, patients should be moved after the relief from shock and before the development of complications.

The preliminary use of chemotherapy and antibiotics in massive doses, orally or by injections, is indicated as a first aid measure. The value of local application of these agents as a first aid measure is debatable, and in my opinion they should not be used because of their tendency to produce further irritation, tissue damage, and possible sensitivity. However, at the time of surgical intervention, following the removal of all devitalized tissue, their use in the form of irrigations and/or implantation is, I feel, practical and logical.

It is during the initial stage of treatment that the brunt of the problem rests heavily upon the shoulders of the physician in attendance. The determination of the nature and extent of the injuries sustained, while often difficult in the early stages, is of extreme importance, as the whole approach to the subsequent treatment is usually based on this early assessment. It is, therefore, imperative that the physician (1) evaluate the patient's cardiorespiratory physiologic state (for example, cyanosis, dyspnea, and venous engorgement); (2) make an accurate appraisal of external wounds (including the track that any missile may have taken within the body, open or sucking types, rib fractures, et cetera); (3) determine the physical signs which, although relatively few at this stage, include position of the mediastinum; presence or absence of dullness or hyper-resonance; and the presence, absence, or diminution of breath or cardiac sounds.

Skiagrams should be obtained in the erect position as soon as possible after injury for evaluation in respect to: (1) retained foreign bodies; (2) damage to the bony cage; (3) state of the lung, whether aerated or atelectic, expanded or callapsed; and (4) contents of the pleural cavity. These films are of great importance as a comparative aid in the final determination of treatment, whether surgical or conservative.

The answer to the question of whether conservative or operative treatment should be utilized in the early stages will depend on the experience of the examiner and the facilities at hand. Surgery within the pleura should not be attempted unless the surgeon is prepared to cope with any and all of the problems he may encounter. In general, it may be stated that major thoracotomies should not be undertaken except by experienced surgical teams with adequate equipment. Without such facilities, it is far wiser to pursue a conservative course.

A simple treatment guide may, therefore, be presented in relation to wound classification. It is as follows:

1. Injuries which should be treated conservatively:
   a. Crush injuries.
   b. Blast injuries.
   c. Small nonsucking penetrating wounds with or without hemothorax.
   d. Cardiac wounds not associated with tamponade or massive hemorrhage.
2. Injuries requiring major surgical care within first 48 hours and after adequate shock therapy:
   a. Sucking wounds.
   b. Extensive wounds in association with fragmentation of ribs.
   c. Large retained foreign bodies, extrinsic or intrinsic in origin.
   d. Persistent, intrapleural, intrapericardial, bronchial, or external hemorrhage.
3. Injuries requiring later surgical care:
   a. Clotted hemothorax.
   b. Diaphragmatic hernias.
   c. Foreign bodies causing persistent symptoms.
   d. Septic complications in the lung or pleura not responding to adequate aspirations and medicinal therapy.

CONCLUSION

It has not been the purpose of this paper to direct or dictate treatment of traumatic chest injuries, but rather to stimulate thought in the matter of emergency first aid and diagnosis. Following the dictates of the old saying concerning skillful neglect and watchful expectancy is, I feel, mandatory in the proper care and treatment of thoracic injuries. A little common sense, well applied, will save more lives than it loses. I, therefore, again admonish you not to be "knife happy" but sensibly hesitant not only for the betterment of your patient, but also for the sake of your own conscience.

6006 S. Western Ave.

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Urologic Trauma

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This paper will add very little to your knowledge in "on-the-spot" handling of injuries to the urological tract, but calling your attention to the varied types of injuries and the importance of early recognition of possible severe renal hemorrhage or urinary extravasation from a ruptured bladder may aid you in making an intelligent segregation of patients for priority transportation to a base hospital.

Urinary injuries incurred in war are so often closely concerned with injury to the surrounding tissues that their recognition may be difficult. Exact diagnosis can be made in many cases only at hospitals equipped with instruments of precision. In disaster areas and combat zones the element of shock and the lack of adequate facilities are such that only the simpler methods of diagnosis can be employed.

External evidence of injury to the kidney, bladder, and urethra should be watched for routinely. Insertion of a urethral catheter, with careful aseptic precautions, may be indicated if the patient is unable to void urine freely, or to determine the existence of residual urine or hematuria which otherwise might not be obvious. During surgical procedures for intra-abdominal lesions, careful inspection for evidence of injury to the kidney, ureter, and bladder should be a routine procedure.[1]

Injuries of the urinary tract may be divided into two general groups, namely, penetrating and crushing, with or without superficial lacerations. As mentioned above, these injuries are rarely confined to the urinary tract, but will almost always be associated with injuries to other organs and tissues.

RENAL INJURIES

Injuries of the kidney, the most important of which is rupture, may be caused by concussion as well as by direct trauma. If the rupture is intracapsular the symptoms may be slight and recovery will follow without interference. In rupture of the kidney substance involving the capsule and/or the pedicle the immediate and serious problem is shock and hemorrhage. Absence of blood in the urine in no way rules out injury to the kidney as there may be a complete block or severance of the ureter.

Penetrating wounds of the kidney produced by small objects, which cause only slight hemorrhage and do not interfere with the normal drainage from the kidney, need little consideration until the patient reaches a base hospital where complete diagnostic facilities are available.

The general surgical team will be called upon to handle most of the cases of severe hemorrhage and shock due to renal injury. During abdominal exploration careful palpation of the kidneys should be carried out. If evidence of a posterior peritoneal mass is found, but the damage seems slight, surgical exploration should be postponed. However, if the damage seems serious, exploration should be made at once through a second incision in the posterior lateral route rather than by the transabdominal route. Transabdominal access to the kidney opens a field which is readily contaminated from intestinal injuries and also provides poor drainage for the renal fossa.

In treating wounds of the kidney there are three principal surgical procedures to consider:

1. Drainage of the renal fossa.
2. Partial nephrectomy with repair of the injured kidney.
3. Nephrectomy.

In speaking of these procedures let me point out that nephrectomy should always be postponed if at all possible, that is, where loss of blood can be controlled without ligation of the main blood supply to the kidney. A patient who has rupture involving the entire vascular pedicle rarely reaches the operating table in a condition suitable for operation.

General systemic care to prevent renal failure should be instituted early in all crushing injuries whether the kidneys have been involved or not. Bywaters[2] advises establishment of good alkaline diuresis as soon and as rapidly as possible even before treatment of shock or of the local lesion. After renal failure has occurred, intravenous administration of fluids and diuretic drugs is of little value—usually it only increases the edema.

BLADDER INJURIES

If the bladder is full at the time of concussion or a crushing accident it may be ruptured. It is often penetrated by particles of bone in pelvic fracture and is subject to penetration by foreign objects in wounds caused by explosion and gunfire. Rupture of the bladder may be intraperitoneal, extraperitoneal, or both.

Rupture of the bladder is an emergency of the first magnitude. Diagnosis must be made and treatment instituted within a few hours. Exploration is justified when history and findings indicate rupture even if the diagnosis has not been definitely established.

The establishment of suprapubic drainage at the earliest moment is of the utmost importance in all cases of rupture of the bladder, whether intraperitoneal or extraperitoneal. Drainage of the abdominal, prevesical, and even the perineal regions may be needed in addition to cystostomy if extravasation has involved these areas.

URETERAL INJURIES

The ureter is seldom injured except in deeply penetrating massive lacerations involving the intestine and other abdominal viscera. Ureteral injuries are mentioned here only to call attention to their possibility when exploring and repairing other viscera.

6331 Hollywood Blvd.

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The Hand

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Hand surgery is perhaps one of the most neglected of all fields. Not only is the importance of injuries of the hand not properly appreciated, but interest is not widespread. From the standpoint of the patient, this lack of interest probably stems from the fact that hand wounds are usually not impressive and seldom cause death. From the standpoint of the doctor, surgery of the hand requires arduous and careful work and requires not only an understanding of the principles of surgery but also a knowledge of anatomy.

The hand, the most useful and the most vulnerable member of the human body, is subject to a great variety of injuries which generally are first seen and first cared for by the physician most readily available. Upon this doctor rests the responsibility for the prompt and accurate diagnosis of the injury sustained, and upon his judgment the eventual outcome largely depends. The first attending surgeon's original management of the situation is the most important single factor in determining whether the injury will be speedily healed with early restoration of maximum usefulness or whether disabling deformities or complications will ultimately result.

Usually, minor injuries of the hand, so often neglected by the patient, come under the doctor's observation only when the invasive and destructive effects of infection are already well established. Therefore, he must be trained to recognize at once the extent and seriousness of the trouble and to deal with it with good practical and scientific judgment and skill.

Severe mutilating injuries of the hand are in wartime, unfortunatetly, not rare. Any severe trauma may result in loss of fingers, part of the hand, or the whole hand. Explosions, crushing injuries, and mangling are frequently responsible for serious structural damage to the hand which presents to the surgeon problems which tax his ingenuity. He will, however, be guided by three principles in his solution of these problems: (1) combating infections, (2) promotion of healing, and (3) conservation of tissue.

The first principle, combating infections, consists of avoiding further contamination in the application of the first dressing, the early adequate treatment of the wound, meticulous care and asepsis in the cleansing of the surrounding area and of the wound itself, and in the careful débridement of all devitalized tissue.

The second principle, promotion of healing, is concerned with such measures as may be safely taken for closure and early or late covering of denuded surfaces and with appropriate dressing and aftercare of the wound, which involve protection of the injured tissues, assuring asepsis, and immobilization for complete rest by appropriate splinting or traction in the correct position.

The third principle, conservation of tissue, is fundamentally involved in the other two. All tissue in the hand which may be safely retained, in accordance with the first two principles, should be spared and protected. No tissue should be sacrificed to speed healing for the purpose of saving time. In approaching major injuries of the hand, the question often arises whether or not to hasten recovery and restoration of use at the expense of lost tissue. It is held by some surgeons that early return to productive activity is the deciding factor. Every part of the hand and every useful fraction of an inch of finger that can be preserved increase the hand's efficiency to a definite degree. Therefore, it is my opinion that the possible preservation of efficiency should never be jeopardized for the sake of a shortened convalescence—particularly in a patient whose livelihood, not only at the moment but through all his active years, depends upon the usefulness of his hands. It is a shortsighted policy indeed which will save a few days or weeks of time at the cost of impaired efficiency throughout life. Tendons, nerves, joint capsules, and bony structures may, any or all, be involved in each forceful trauma to the hands. The future function of the parts depends upon proper care of these structures.

The question will arise in the minds of many surgeons as to the proper procedure regarding primary or secondary repair, especially in respect to tendon severance. If the wound is clean, and few are; if the loss of tissue is at a minimum; and if the time elapsed since the injury is not more than 6 hours; then, if the proper instruments, lights, materials, and aseptic surroundings are available and the surgeon's time is not a problem, then and only then should a primary tendon repair be attempted. Frequently it is safer to cleanse properly, conserve tissue, splint and allow the parts to heal, and later under ideal conditions and with plenty of time go about the business of secondary repair and reconstruction.

Skin grafting, pedicle flaps, and other types of skin transfer are very useful in the care of trauma to the hands. Immediate pedicle or split-thickness grafts may be the means of conserving parts that otherwise would be lost for lack of integument or crippled due to excessive scar tissue.

The antibiotic drugs and gas gangrene and tetanus anti-serums are useful adjuncts in the care of hand injuries and should be a part of every emergency supply kit. Dressing materials, slings, splints, plaster, and medications are all used in the treatment of hand injuries and a good supply must be available.

CONCLUSION

It has been the purpose of this paper, not to present a detailed discussion of the many specific types of injuries and an outline of treatment for each, but to cite principles which should be the surgeon's guide in handling injuries to the hand.

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THE SURGICAL NUMBER

All of the original articles in this issue of THE JOURNAL were presented at the Twenty-Sixth Annual Clinical Assembly of the American College of Osteopathic Surgeons held in Los Angeles from October 18 to 22, 1953. The unusual number of papers suitable for publication made it mandatory that an entire issue of THE JOURNAL be devoted to them, instead of the usual supplement. The wide range of subjects and the variety of approaches to them make these papers valuable for all osteopathic practitioners.

Dr. J. Willoughby Howe, Hollywood, California, president-elect of the College, was program chairman for the meeting from which the papers originated.

The Editorial Committee is as follows: Dr. Don E. Ranney, Detroit, chairman; and Drs. Leonard C. Nagel, Cleveland, K. George Tomajan, Boston, Leo R. Conley, Columbus, Ohio, and Benjamin Greenburg, Los Angeles.

Dr. James O. Watson, Columbus, Ohio, presided at the 1953 meeting. The present officers are: Dr. James M. Eaton, Philadelphia, president; Dr. J. Gordon Hatfield, Los Angeles, vice president; Dr. Charles L. Ballinger, Toledo, Ohio, secretary-treasurer.

FIFTIETH ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

The Fiftieth Annual Congress on Medical Education and Licensure, held in Chicago last month, was of more than usual significance to all individuals and organizations interested in medical education and the licensure of physicians. Despite its minority status numerically, osteopathy has majority status in the field of medical education, and by licensure in a majority of states and territories. The Congress consisted of 3 days of meetings and discussions, of which the major part was taken up by the Federation of State Medical Boards of the United States, and another portion by the Council on Medical Education and Hospitals of the American Medical Association.

The opening roll call of the Congress indicated that a large percentage of members of state medical boards was present; the Tennessee State Board of Medical Examiners alone is not affiliated with the Federation. Included in the membership are fifteen states that have composite boards, that is, boards with both doctors of osteopathy and doctors of medicine as members. Of the composite boards, osteopathic members were registered from Colorado, Kentucky, New York, Oregon, South Dakota, Texas, and Wisconsin. Osteopathic members of the basic science boards of Colorado and New Mexico were also present. Osteopathic membership in the Federation and participation in the Congress has limited itself to representatives from those states that possess composite boards, since the Federation in its majority is an organization of licensing bodies whose membership is made up of doctors of medicine. This excludes osteopathic representatives from those states that have separate licensing boards for the osteopathic profession, which are composed only of doctors of osteopathy. No osteopathic representatives were present from states which have osteopathic examiners serving as consultants to the medical boards.

An organization of licensing bodies composed of representatives of both unlimited schools of medicine is a matter of public interest. The Federation of State Medical Boards of the United States and the annual Congress on Medical Education and Licensure have as their high objective the improvement of healing art education and licensure. The attendance and participation of doctors of osteopathy from states having composite boards is becoming more than a responsibility; it is a duty involving the promotion of public health. Those doctors of osteopathy who were present at the meeting deserve special commendation. It is the studied opinion of osteopathic observers present that our profession's attendance as members of this Congress should approach its total eligibility as rapidly as possible. The attendance of osteopathic members is prima facie evidence to other professions that we by-pass no opportunity to assume our share of public responsibility.

The Congress was conducted in an attitude of friendliness and cooperation to the degree that all the participants met their peers upon a personal and professional level consistent with the objectives of the Federation and the Congress. There were many informal discussions among doctors of osteopathy and doctors of medicine who were members of licensing boards, colleges of medicine, and medical institutions, and all in a natural and unforced atmosphere. These annual meetings, although sponsored by the American Medical Association, are the only occasions when representatives of allopathic and osteopathic medicine meet together in a common membership, motivated by a common interest. It is an occasion when the American Medical Association appears to recognize that its obligation to public welfare comes first, and it should be properly commended for its enlightened attitude in this

matter. The occasion reflects a breadth commonly shown by higher caliber doctors of medicine, but rarely evinced by the Association in its official actions.

One portion of the program was seized upon by the Chicago press as presenting sensational news value, made plausible by the language of several doctors of medicine who played into the hands of the journalists. As a result, newspaper headlines proclaimed, "M.D., Osteopath Tangle over 'Cult' Charges," and "Renew Dispute on Osteopathy." The occasion for this untoward publicity was a paper read by a former secretary of the Nebraska Board of Medical Examiners, entitled on the printed program, "Is Osteopathy a Cult?" and retitled upon presentation, "Is Osteopathy Still a Cult?" It was unfortunate from the point of view of its author that all of the other papers gave ample evidence of careful preparation based on logical marshalling of related facts, with conclusions derived from an objective analysis of the evidence presented.

"Is Osteopathy a Cult?" as a subject demanded that its author should define his understanding and usage of the word "cult." Since the word has an emotional connotation, treatment of the subject should have been highly objective, historical in approach, and rich in sources related to the social milieu in which the so-called "cult" had its origin. The subject demanded a developmental interpretation and evaluation. Modify the subject to establish a premise, as the author did, and its presentation becomes more difficult, requiring not only a historical, but a dialectical approach.

The author, however, appeared interested only in presenting those parts of the A.M.A. 1953 Report of the Committee for the Study of the Relations between Osteopathy and Medicine which would give credence to his own premise that osteopathy is a cult and which would counter the recommendations of the Committee. Four other doctors of medicine discussed the paper from the floor but without an apparent judiciousness, and with considerable display of emotion. Impartial observers concluded that much heat and little light were thrown by those who participated.

Osteopathic members of the Federation present considered it entirely unnecessary to make a reply to the paper. Several discussants, however, made misstatements of facts relating to inspection of osteopathic colleges by licensing boards. An osteopathic member of the Colorado Board of Medical Examiners—a composite board—thereupon asked the presiding officer for the floor, and his request was courteously granted. He corrected the misstatement, pointing out that licensing boards under legal authority and appropriate conditions are welcome to visit and inspect osteopathic colleges. He suggested that haggling and a feeling of acrimony between the two professions were not in the best interests of the public health of the nation. His remarks were well received and he was given a round of applause when he took his seat. The entire performance suggested that a small faction in the Congress was interested in discrediting the osteopathic profession at this particular time. The paper and its discussion appeared to arouse little interest and seemingly had little effect upon the Congress as a whole, many of whose members did not bother to sit in upon this particular part of the program.

Among the many excellent papers two related to standards of medical education were especially significant. The dean of Columbia University College of Physicians and Surgeons spoke on "The Educational Component of Medical Licensure," reviewing the development of medical practice from the time of the ancient Greeks to the present. He pointed out the necessity for a single educational standard for licensure of physicians. He called attention to the influx of graduates of foreign medical schools into the United States which has resulted in multiple standards for licensure. The secretary of the New York Board of Medical Examiners in further emphasis of the relation between education and licensure presented a paper which dealt specifically with the problem of the graduate from abroad, giving a comprehensive and detailed report on the "Evaluation of Credentials Submitted by Foreign Medical Graduates."

These two papers were authoritatively supplemental. The Congress was informed that there are more than 500 foreign medical schools throughout the world, which for the most part since World War II present no equivalence in training to that received by students attending schools of medicine in the United States. One of the medical schools in Paris, France, alone is estimated to have 7,000 students. Didactic instruction is the rule in these schools and some of them were said not to have changed their curriculum in 50 years.

It was pointed out that as early as 1939 disintegration of foreign medical schools began, resulting in a destruction so complete that only their reputation has survived. English medical schools alone have weathered the holocaust. Infiltration of graduates of these quasi-medical schools into the United States began more than a decade ago and is now reaching such a peak that the speakers agreed that it constitutes a menace to medical standards in this country. It was shown that graduates of foreign medical schools entering the state of New York now total more than the entrances of graduates of approved medical schools. One out of every four internships in that state is filled by an alien physician, a matter of moment, since one-sixth of the A.M.A. approved internships are located in hospitals in New York. In New Jersey approximately 48 per cent of the interns are graduates of foreign medical schools. Admittedly, the problem is so serious as possibly to bring medicine back to the level it occupied at the turn of the century.

The speakers dealing with the problem of the foreign medical graduates were agreed that at present each foreign applicant must be judged on his individual merits. Some of these foreign physicians are well trained, are of great capacity, and have made distinguished contributions to medicine, and they should not be lost to American medicine. But the situation as it exists constitutes a threat to the long-sought objectives of the Congress.

During the past year an important study on the "Essentials of a Modern Medical Practice Act" was

undertaken by a Committee of the Federation appointed for that purpose. The study revealed that as early as 1909 efforts had been made to prepare a model act, but due to lack of agreement no further attempts had been made until 1953. The Committee's report revealed that the first medical laws requiring an examination of applicants to practice medicine were passed by the States of Mississippi and Utah in 1882, and the last state to pass such a law was Oklahoma in 1908. Uniformity in medical laws is still almost completely lacking, and the variations range from no requirement for preprofessional education to no one examination subject occurring in all state laws. Little uniformity of ground for revocation of license was found, nor were there common standards set up for the moral character of licensed physicians. In many states appointments to the Medical Board are made without control or advice by medical groups; some boards have members other than physicians; and in many there are no requirements for the member's fitness to serve on the board. Reciprocity laws have widely varying provisions.

As a result of the study the Committee on the Essentials for a Modern Medical Practice Act recommended that a Uniform Medical Practice Act be drafted after further study and that this model act be submitted to the next annual meeting of the Federation (February 1955). It was conceded that uniformity in medical practice acts could never be achieved at the expense of state rights. The Committee recommended, therefore, that state and territorial medical examining boards, deans of medical schools, and *other interested groups* be contacted by means of a questionnaire which would seek information on provisions which such organizations and groups felt should be included in any Uniform Medical Practice Act. The Committee seemed very conscious of the rights of the sovereign states to regulate the practice of medicine and wanted to make sure that it would not make difficulties for its suggested program by creating hostility in the states themselves. All the recommendations were adopted by the Federation.

There were other papers of importance given and significant reports made, especially one relating to licensure problems in which it was contended that the establishment of any new basic science laws in states which do not have them be discouraged and that those now active be revoked. A more specifically detailed report of the Congress will be found in the columns of the Department of Public Affairs under the Bureau of Public Education on Health in this issue of THE JOURNAL. Its careful study is advised.

Osteopathic education is more than 60 years old and osteopathic licensure covers almost as long a span —actually the lifetime of the profession. Through education and licensure the profession sought from its earliest beginnings to safeguard the public which turned to it for health care. It has based its claim for practice rights upon educational standards consistent with the emerging and developing standards of medicine generally. Practice rights in certain instances have lagged and continue to lag far behind the educational standards of the profession, working an injustice both upon individuals and the public which the profession is prepared to serve without limitation in health care.

Osteopathic medicine supports every advance in medical education and supports every move to protect public welfare through adequate licensure. It welcomes such uniformity in practice acts as will guarantee better medical care and offer additional protection to the public from the charlatan and the quack, literate or illiterate. The profession is proud of the unlimited practice rights granted it by so many states, a right founded upon valid and acceptable educational standards that are not questioned by unprejudiced and informed authorities. It is duty bound to safeguard those rights and will do so zealously, but it will work cooperatively with every agency whose demonstrable interests are wider than vested rights conceived as special privileges.

Notes and Comments

"Meetings" are an integral and necessary part of the successful functioning of medical groups—clinics, hospitals, and hospital staffs reaching out to take in boards of trustees, auxiliaries, and community health projects that are related to the service of these institutions. Yet meetings are apt to be innumerable in quantity and interminable in length. Designed to remove the curse that afflicts large and small meetings, the newly created American College of Osteopathic Hospital Administrators has issued the first number of its guide series, "Better Discussion Methods," covering such topics as how to set the stage for an efficient meeting, how to keep a meeting on the right track, and how to evaluate the worth of a meeting just finished. The Guide's ten mimeographed pages are a mine of valuable information culled from five sources and the broad experience of its author. Distribution is to the fellows, members, and nominees for the College from the headquarters of the College at 1013 Kahl Building, Davenport, Iowa. This material is invaluable to anyone charged with the successful conduct of a meeting.

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All physicians will acclaim the Antivivisection Society for its abandonment of its former policy of categorical opposition to scientific studies involving animals. The society's new magazine, *The National Magazine,* the first issue of which was available in January, announced the new policy. An editorial statement on the new policy said in part:

> Today great numbers of antivivisectionists hope that their way of thinking has come somewhat of age. On the one hand, they are aware that certain phases of animal experimentation do not cause pain—and on the other hand they know that many honest medical men have come to feel that at least the worst of vivisectional procedures ought to be halted forthwith.

Dr. A. J. Carlson, Frank P. Hixon Distinguished Service professor emeritus and president of the National Society for Medical Research, stated that N.S.M.R. was in complete agreement that there should be absolutely no cruelty in animal experimentation. He pointed out that scientists have long been interested in doing practical things to improve the care and treatment of laboratory animals. The American Osteopathic Association is one of more than 200 scientific and civic organizations associated with N.S.M.R. in a positive program to bring the truth about medical research to the public. All doctors should be sufficiently informed about that movement to enlighten their patients. Too many humane societies have been antivivisectionist dominated even though many of their members were not averse to the saving of condemned animals for scientific study.

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Attention of osteopathic physicians interested in the more technical aspects of physical medicine will wish to read two short practical and most informative articles in the December, 1953, issue of the *Archives of Physical Medicine and Rehabilitation.* Otto Glasser, Ph.D., of the Cleveland Clinic Foundation, writes on "A Medical Physicist Looks at Physical Medicine." In relation to ultrasonic energy in dosages as now supplied, Dr. Glasser points out that there is no definite indication that it produces any specific biologic effects. There are indications that ultrasonic energy increases tissue temperatures and is therefore useful in treating conditions which are beneficially influenced by diathermy. The second article is by Justus F. Lehmann, M.D., of the Mayo Foundation, writing on "The Present Status of Ultrasonic Therapy." He points out that it is his observation that knowledge of the biophysical mode of action of this type of therapy is necessary in order for the physician to apply ultrasonic radiation safely. The results of the therapeutic effects of ultrasonic energy need further investigation and evaluation. The articles should be read in their entirety.

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A new technic, corrective surgical planing of the skin, developed by Abner Kurtin, M.D., a New York dermatologist, for restoring scarred faces and other areas to near normal has been described by James Stover, D.O., in a personal communication. Linear scars so often seen following car accidents and surgery, smallpox and chicken pox marks, burn scars, horny growths such as warts, wrinkles, tattoos, some moles, port-wine stains, the disfiguring pits and scars following acne, and even superficial malignant skin tumors, all respond 60 to 80 per cent and better to this new method of plastic planing.

The importance of this new type of surgery, besides the actual end-results, lies in the fact that it is entirely an office procedure, thus avoiding hospitalization. It is less time consuming and less expensive than more usual procedures, and no general anesthesia is required. The danger of silica granulomas, which often occur after use of the sandpaper technic, is avoided.

The plane is a motor-driven brush of stainless steel wire, disk shaped like a dentist's buffer, rotating at 12,000 r.p.m. Following chilling by a chemical ice pack, the scarred surface is frozen by a spray of ethyl chloride and an air current directed by a special blower. The frozen skin remains rigid and insensitive while the powered brush removes the top layers. The field is bloodless, permitting exact and delicate work. When thawing takes place a slight oozing of blood and serum begins. Dry gauze dressings are applied and the patient is sent home; thereafter he changes his own dressings. In about 3 days a dry crust appears and further dressings are not necessary. Healing is usually complete in about a week with new soft, pliable, pinkish skin. Normal color returns in a few weeks. A single planing may suffice for the average case. However, the procedure may be repeated after 4 to 6 weeks.

The original technic was described by Dr. Kurtin in the "Archives of Dermatology and Syphilology," October, 1953. Dr. Stover has recently had the opportunity to spend time with Dr. Kurtin in New York observing and learning his technic.

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The United States Public Health Service has announced a competitive examination for appointment of Medical Officers to the Regular Corps of the Service will be held on June 1, 2, and 3, 1954. Examinations will be held at a number of points throughout the United States, located as centrally as possible in relation to the homes of the candidates. Applications must be received no later than April 30, 1954. Application forms and additional information may be obtained by writing to the Chief, Division of Personnel, Public Health Service, Department of Health, Education, and Welfare, Washington 25, D.C.

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This column reported in the February, 1954, issue the publication of an article in *Euclides* by Reinhard H. Beutner, Ph.D., entitled "The Intra-Lipoidal Origin of the Nerve Action Potential Through Reversible Phosphatide Splitting." Dr. Beutner's status is that of Associate Professor of Pharmacology at the Des Moines Still College of Osteopathy and Surgery. William F. Hewitt, Jr., Ph.D., is Professor of Physiology and Chairman of the Department of Physiology and Pharmacology.

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A small but noteworthy series of achievements can be credited to clinical medical research in 1953. Dr. Ludwik Gross (VA Hospital, Bronx, N.Y.) demonstrated that leukemia is probably caused by a virus. . . . The Wellcome Research Laboratories discovered that 6-mercapto-purine causes acute leukemia to disappear temporarily. The drug has been tested at The

Sloan-Kettering Institute for Cancer. If it does not cure it prolongs life for a short period. . . . Dr. Jonas Salk, whose poliomyelitis vaccine is to be tested on a large scale this year, has recorded a new vaccine said to protect against all types of influenza for 2 years. Studies have been made on thousands of cases—not deemed enough for full proof. . . . Drs. Christian B. Afinsen, Edwin Boyle, Joseph Bragdon, and Ray K. Brown, all of the National Heart Institute, made the important discovery in 1953 that a clearing factor that dispels the cloudiness that follows in blood after the consumption of a fatty meal, can be synthetically produced in large amounts. This may be of importance in the treatment of arteriosclerosis and coronary disease, the courses of both of which are influenced by fats which have not been adequately metabolized by the body. A team of Columbia University scientists under the direction of Dr. Charles Glenn King has made a related discovery in that vitamin C has been proved to regulate the rate at which cholesterol is formed.

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The September and December issues of the JOURNAL referred to Public Health Service Research Fellowships which are awarded by the Public Health Service for the purpose of developing competent research workers in health problems related to the medical sciences. These fellowships are now confined to the postdoctorate level so that persons holding a bachelor's or master's degree are no longer eligible. A postdoctorate research fellowship can be awarded to qualified persons holding a doctor's degree in medicine—which of course, includes doctors of osteopathy—dentistry, and related fields.

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The relatively few anaphylactic fatalities following the use of penicillin could be reduced further if the antibiotic were entirely withheld from patients afflicted with bronchial asthma or showing other types of allergic response to sensitizing substances—this was the consensus among authorities speaking at a 3-day symposium on antibiotics held in Washington at the end of the year. A note of warning to the general physician was sounded by Dr. Maxwell Finland, Boston City Hospital, who said: "The busy practitioner is particularly desirous of having some major weapon on which he can always rely to be successful in all types of infections, and which would thus relieve him of the responsibility and trouble involved in the complicated or even simple diagnostic procedures. . . . The discriminate choice of therapeutic agents only on the basis of proper indication and proved efficacy for the desired purpose, though perhaps more difficult to practice, may in the long run be less disappointing and more rewarding."

Proposed Amendments to the Bylaws and Code of Ethics of the American Osteopathic Association

R. C. McCAUGHAN, D.O.
Executive Secretary

BYLAWS

(The following proposed amendment is published at the direction of the Board of Trustees on recommendation of the Committee on Membership Approval.)

Article II—Membership

Amend Section 6 by adding thereto a parenthetical sentence to read as follows: "(Effective June 1, 1956, Section 6 above shall be rescinded and deleted.)"

(The following proposed amendment is published at the direction of the Board of Trustees on recommendation of the Executive Secretary.)

Article VI—Elections

Amend Section 1 by adding thereto as the last sentence, "Membership in the A.O.A. and in one of its divisional societies shall be a requisite for qualification for any officer or for any member of any department, division, bureau or committee of the Association, however selected, if the incumbent shall be a Doctor of Osteopathy."

(The following proposed amendment is published at the direction of the Board of Trustees in order to carry out its already established policy that the President shall be an ex-officio member of all committees.)

Article VII—Duties of Officers

Amend Section 1 by adding thereto, at the end of the paragraph, a new sentence to read as follows: "He shall be an ex-officio member of all departments, divisions, bureaus and committees of the Association."

(The following proposed amendment is published on recommendation of the Connecticut Osteopathic Association, and with the approval of the Board of Trustees and the House of Delegates.)

Article IX—Departments, Bureaus, Committees, and Sections

Amend Section 4 by adding thereto as a new paragraph the following:

"Membership in the Association and in one of its divisional societies shall be a requisite for qualification for any officer and any chairman or member of any department, division, bureau, or committee of the Association and for any other elected or appointed person within the operating mechanism of the Association, if the incumbent shall be a Doctor of Osteopathy."

CODE OF ETHICS

(The following proposed amendment is recommended by the Board of Trustees of the Association.)

Chapter II. Article V.—Differences Between Physicians

Amend Section 1 by adding thereto, at the end of the section, the following sentence: "The commission of libel or slander by one member of the profession against another is unethical."

Department of Public Affairs

DONALD M. DONISTHORPE, D.O.
Chairman
Los Angeles

BUREAU OF PUBLIC EDUCATION ON HEALTH

HOBERT C. MOORE, D.O.
Chairman
Bay City, Mich.

FIFTIETH ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

The Fiftieth Annual Congress on Medical Education and Licensure was held in Chicago on February 7, 8, and 9, 1954, under the joint sponsorship of the Federation of State Medical Boards of the United States, the Council on Medical Education and Hospitals of the American Medical Association, and the Advisory Board for Medical Specialties. The meetings of the Congress are open to physicians and other persons interested in medical education.

In attendance at the Annual Congress were members of the various medical licensing boards, representatives of medical colleges, and other persons representing groups or organizations interested in the education and licensure of physicians and surgeons. Doctors of osteopathy present represented the composite medical licensing or examining boards of the following states: Colorado, C. Robert Starks and Cecil C. Thorpe; Kentucky, Carl J. Johnson; New York, John R. Pike; Oregon, David E. Reid; South Dakota, James H. Cheney; Texas, R. H. Peterson; and Wisconsin, E. C. Murphy. Two doctors of osteopathy representing state basic science boards were also present: Esther Starks, Colorado; and Lawrence C. Boatman, New Mexico. The attendance of these doctors at the meetings constituted an important contribution of time and effort. Their presence will, however, help them to serve better as members of state boards. The administration of a state licensing law is the primary function of a state board and the carrying out of this function requires members to possess considerable knowledge of and information on national problems relating to education and licensure as well as matters pertinent to the law of each state. The program of the Annual Congress is one of the best sources of such information available.

Approximately one-half of the annual program is presented by the Federation of State Medical Boards of the United States. Walter L. Bierring, M.D., Des Moines, Iowa, is the long time secretary-treasurer of the Federation and also editor of the *Federation Bulletin*. Two of the most interesting subjects on the agenda presented by the Federation were the reports submitted by the chairmen of two committees which have, over the past year, been studying problems relating to the licensure of physicians and surgeons.

One of these reports was submitted by Bruce Underwood, M.D., Commissioner of Health of Kentucky, who is the chairman of the Committee on Essentials of a Modern Medical Practice Act appointed by the Federation. Membership of this committee is composed of members of medical licensing boards. The members in addition to Bruce Underwood, M.D., of Kentucky, chairman, are J. Earl McIntyre, M.D., Michigan; Walter E. Vest, M.D., West Virginia; S. M. Pointdexter, M.D., Idaho; Creighton Barker, M.D., Connecticut; and Homer L. Pearson, M.D., Florida. George R. Buck, M.D., Colorado, was added to the membership of the Committee at this meeting. This Committee reported as follows regarding the need for a modern medical practice act:

> Your committee believes that our federation should draft a uniform medical practice act that could be used as a guide by the states in revising existing medical practice acts. Each state would retain its own rights and prerogatives in any future revision of its medical practice act either to conform with the uniform act or not to conform with it as might be desired by each individual state. It seems to us that since all medical schools in the United States have become fairly uniform and have substantially the same curriculum that there is a need now more than ever before for a greater degree of uniformity in the legislation that governs the practice of medicine in the several states. We believe that a uniform medical practice act is urgently needed and that our federation should draft it. We also recognize the need for proceeding slowly and with due caution in all the many factors involved.

The committee submitted the following recommendations which were adopted at the official business meeting of the Federation:

> (1) That a committee to draft a Uniform Medical Practice Act be appointed.
>
> (2) That a questionnaire be sent to all the members of the state and territorial Medical Examining Boards, Deans of each Medical School and to such other interested persons who, in the opinion of the committee, might be of assistance.
>
> (3) That the committee be instructed to present back to this federation, at its next annual meeting, a proposed draft of a Uniform Medical Practice Act for further consideration.

The same Committee, therefore, will report back to the Federation of State Medical Boards of the United States in accordance with the above recommendations at its next annual meeting which will take place during the next Annual Congress on Medical Education and Licensure in February, 1955.

The second report of a Committee which was of particular interest to persons concerned with the licensure of physicians and surgeons was the Report of the Joint Committee on Licensure. This Committee is composed of members representing the Association of American Medical Colleges, Federation of State Medical Boards of the United States, and the Council on Medical Education and Hospitals of the American Medical Association. The General Chairman of the Committee is Carl A. Doan, M.D., Dean of Ohio State University College of Medicine. The Joint Committee has now submitted three reports to the organizations which it represents. In these reports many subjects pertaining to the education and licensure of physicians and surgeons have been covered and recommendations made concerning them. The subject most fully discussed in these reports is that of basic science laws. In its original report the Joint Committee adopted eight recommendations to send back to their respective organizations, one of which is as follows:

> 7. A very considerable opposition to the present basic science law requirements for licensure and reciprocity was apparent among those on this committee. It was strongly felt that the original objectives were no longer being served and that all such state laws should be repealed or reinterpreted.

A subcommittee of the Joint Committee on Licensure submitted to the Joint Committee a report documenting the validity of recommendation No. 7. This documentation which has been referred to as Appendix A To The Supplemental Report of the Joint Committee on Licensure was adopted by the Joint Committee on Licensure. This documentation reads as follows:

> At a meeting in Chicago in February, 1953 and again in Atlantic City, October 25, 1953, serious consideration was given to the present usefulness of the Basic Science Boards, and whether their original objectives are now being served. The initial activating purpose of the Basic Science Boards was to broaden the foundations and to raise the educational standards for all who aspire to practice any one of the healing arts.
>
> In 1925, Connecticut and Wisconsin were the first states to enact legislation requiring all practitioners of the healing arts to take and pass an examination demonstrating a working knowledge of the underlying sciences upon which health is based. Other states have since followed with similar legislation until now a Basic Science certificate is prerequisite for medical licensure in 19 states, the District of Columbia and Alaska. Commendable as may have been the objectives of Basic Science laws as originally conceived, the actual results have not been those which were anticipated. Instead, we find the following:
>
> (1) The total numbers of practitioners of osteopathy, chiropractic and naturopathy, have actually increased. For example, in one state the number of registered chiropractors increased from 492 in 1940 to 747 in 1950, an increase of 50 per cent in ten years. A substantial percentage of these men who in general have not had quality education in the basic sciences, have nevertheless passed the basic science examining Boards—60 per cent of 12,112 examined in 1927 to 1952. The application of these laws has not therefore been successful in insuring that all practitioners of the healing arts are adequately prepared in the Basic Sciences.
>
> (2) Qualified physicians have been discouraged from entering practice in states with Basic Science laws. Although the examinations usually are more of a nuisance than an embarrassment to recent medical graduates, those who have been in practice for a number of years, find the burden of review work for the examinations often too great to undertake. There is abundant evidence that this has happened with an adverse effect at times on the distribution of physicians to areas of need.
>
> These factual results have raised once again for reevaluation the objectives of the Basic Science examinations and their relationship to the

philosophy of medical education and teaching practices today. The purpose of the examinations is to insure, if possible, reasonable knowledge and adequate training in the Basic Sciences prerequisite to the practice of Medicine. It appears clear that these examinations can be passed by those who study intensively for them, irrespective of the quality of the education and training presumed to have been attained. It is also known that men adequately trained and possessing reasonable knowledge may practice Medicine effectively for years, though not retaining the detailed information required for repassing such an examination. This may explain why many cultists can pass the examination, while many adequately trained, capable and reputable physicians may be reluctant to choose to take the examinations if they have been in practice for a number of years.

Most important, however, is the educational trend to abolish the arbitrary distinction between the Basic Sciences and clinical medicine, in order to achieve a well integrated and continuous medical educational full-rounded experience over 4 years. This has been emphasized in the report of the findings in this year's Institute on the teaching of Pharmacology, Physiology and Biochemistry.

In view of these considerations, it is the recommendation of your Committee on Licensure, that the establishment of any new basic science laws in states which do not now have them should be discouraged; that basic science laws in the states where they now exist should be revoked, and that in a continuing effort to achieve the worthy objectives for which these laws were originally intended, consideration should be given to the following: (a) Greater weight to the quality of education and training received in the basic sciences by the applicant, and (b) a wider use of Part I of the National Board Examinations as a measurement of knowledge in the Sciences basic to clinical medicine.

This recommendation and its documentation constitute an important and significant change in attitude on the part of the representatives serving on the Joint Committee on Licensure regarding basic science laws. While the recommendations of the Joint Committee are advisory only and are not binding upon the individual states, it seems obvious nonetheless that the above recommendation will have a significant effect upon the continued existence of basic science laws and upon any proposals to enact new basic science laws in the future.

The above discussed subjects are only a few of those included in the agenda of the Annual Congress on Medical Education and Licensure. To persons interested, however, in the licensure of physicians and surgeons they are of considerable interest and may have important effects upon public health laws of this type in the future.

Current Medical Literature

THE USE OF COMPOUND F (HYDROCORTONE) IN OPERATIVE AND NON-OPERATIVE CONDITIONS OF THE HAND

Impressive preliminary results following injection of compound F in hand conditions are reported by Lot D. Howard, Jr., M.D., and others in *The Journal of Bone and Joint Surgery*, October, 1953.

Compound F, which is a synthesized adrenal cortical hormone, 17-hydroxycorticosterone-21-acetate, differs from compound E (cortisone) only in substitution of the hydroxy radical for the oxygen radical. The physiologic properties of compound F are the same as those of cortisone, but compound F is believed to be about 50 per cent more powerful. The action of both is believed to be basically the same. Compound F produces local relief at the tissue level without generalized systemic effects and inhibits inflammatory reactions when injected in small amounts intra-articularly. These are its principal advantages over compound E and should make it the ideal supplement for operative and nonoperative conditions of the hand.

The authors administered compound F to seventy patients with hand conditions. The dosage was empirical but ranged from 0.1 to 0.5 cc. in most cases. In nonoperative conditions injection was made at the site of the lesion; in operative cases the drug was injected into the space of the operative wound after closure.

Ten of eleven patients with tenosynovitis were improved following compound F therapy. One was unimproved. In general, response to treatment was the same regardless of the location of the involvement: Pain stopped and swelling subsided within 12 to 24 hours.

Eleven of twelve patients treated for trigger finger were improved; one remained unimproved. No complications occurred. All patients treated without operation were relieved of pain; of those on whom operation was performed, pain was relieved or was minimal.

All three patients with de Quervain's tenosynovitis showed improvement without complications. It is believed that the two patients treated without operation may have recurrences and in time require surgery, but symptomatic relief apparently occurs shortly after injection of compound F.

After injection of compound F one patient with hard dorsal edema of the hand was improved; the second was unimproved. No complications occurred.

All five patients treated for ganglion were unimproved; four were treated without operation.

Both patients receiving injections for rheumatoid arthritis were improved. Neither was operated on; there were no complications. Neither patient is considered cured.

Three patients with osteoarthritis were treated nonoperatively. All showed improvement, and there were no complications.

All nine patients treated for Dupuytren's contracture were improved. Two small postoperative hematomas occurred which may not necessarily have been due to compound F, although they are listed as complications of treatment.

Six patients on whom tendon-freeing operations were performed were improved. A complication occurred in one case in which osteotomy was done at the same time. In all cases there was minimal postoperative pain and reaction, thus permitting earlier exercise of the freed tendon.

All four patients undergoing tendon suture remained unimproved; one complication occurred.

Compound F in the wounds of nine reconstructive operations seemed to minimize postoperative pain and swelling. A small hematoma occurred in the palm of a patient who had undergone nerve and tendon repair.

Four patients treated for miscellaneous hand conditions were improved. There were no complications in this group.

SURGICAL PATHOLOGY OF THE COLONIC STOMA

Adoption of a program of long-range care to prevent complications of the colonic stoma is suggested by Guy L. Kratzer, M.D., in *Surgery, Gynecology and Obstetrics*, January, 1954.

Retraction of the colonic stoma is usually caused by removing the retaining clamp or other support before healing has taken place, or it is caused by insufficient mobilization of the bowel. The bowel should extend at least 1½ inches above the skin surface without undue tension. In a single-barrelled colostomy it should be kept in that position for at least 8 days and in a loop colostomy, for at least 2 weeks. The average colonic stoma will not need opening before 48 hours; if it should be necessary, it may be opened anytime after 4 hours postoperatively without disturbing the clamp or glass rod since the peritoneal cavity is sealed off by this time. The wound should be protected with Vaseline gauze. Mineral oil is given by mouth if necessary; diarrhea can be controlled with aspirin or paregoric. The wound should be exposed to light and air twice each day. Retraction which takes place several weeks or months after surgery will require a minor plastic procedure to elevate the bowel.

Adequate opening of the bowel, frequent dilatations for at least 3 months after colostomy, and occasional inspection for several years should prevent contraction of the stoma. If contraction occurs, the fibrous skin band is severed as an office procedure, and dilatations are performed as needed.

Prolapse of one or more coats of the bowel, which occurs more frequently as a complication of double-barrelled colostomy, may usually be prevented by bringing out the bowel loop so as to have the proximal limb under slight tension. Simple circular amputation of the mucosa followed with interrupted sutures may be sufficient. In the more severe type of prolapse, transection of the bowel will be necessary.

Herniation of muscles immediately surrounding a colonic stoma can be avoided by bringing the bowel through a separate small muscle-splitting incision. The incision should be just large enough to admit the bowel without danger of strangulation. If repair is necessary, the procedure for any incisional hernia is followed.

Superficial fistulas which do not close spontaneously may be managed in the same way that anal fistulas are managed. Deep fistulas require transection of the involved bowel and bringing out of the mobilized segment just as in the original operation.

Ulceration and hemorrhage can be prevented by placing the opening so as to facilitate fitting of an applicance. Hemorrhage should be controlled by ligation.

Fecal impaction can be prevented by proper bowel hygiene. Irrigation or instillation of mineral oil is the proper treatment.

Mucous or fecal fistula usually heals spontaneously. Associated retraction usually requires surgical elevation of the stoma.

Herniation of a loop of small bowel along the side of the colonic stoma can be prevented by adhering to the rule that the space between the abdominal wall and bowel should be just large enough to admit the tip of the index finger. Abdominal support aided by adhesive straps should be used in the immediate postoperative period. Immediate minimal surgery, with packing and pressure bandages, is the only treatment. Local anesthesia is preferred.

Intestinal obstruction precipitated by a loop of small bowl caught in the space between the stoma and the parietal peritoneum can be eliminated by closing this area at the time of operation.

If necrosis of part or all of the bowel used as the colonic stoma occurs proximally beyond the skin level, the incision must be reopened and enough viable bowel mobilized to serve as the stoma.

DIAGNOSIS AND MANAGEMENT OF ACUTE PANCREATITIS IN GERIATRIC PATIENTS

Thirty-one acute pancreatitis patients over 65 years of age provide the data for an article by Brock E. Brush, M.D., and his associates in the *Journal of the American Geriatrics Society,* November, 1953.

Increased pressure in the pancreatic duct, whether due to obstruction at the bile papilla from stone or cicatricial contraction or to obstruction in the pancreatic duct from stone or metaplasia, appears to be the etiologic factor. Biliary tract disease has so frequently been observed in cases of pancreatic disease that it is regarded as important in the etiology.

Usually the outstanding clinical feature is the severity of pain, some relief of which can often be obtained by sitting up and leaning forward. The onset of the pain is sudden. Pain is most pronounced in the midepigastrium and is often transmitted to the back. Nausea and vomiting occur early in 90 per cent of the patients. The degree of shock varies with the severity of the disease. Clinical jaundice has been reported in one fourth of all patients, but in the series described, it occurred in 45 per cent of patients over 65. Edema of the pancreas and hemorrhage into the peritoneal cavity may occur.

The elevation of the blood diastase level is the chief confirmatory diagnostic finding. Tests for the blood diastase level should be made frequently for elevation often does not occur until several hours after onset of the disease, and as a rule the level returns rapidly to normal after 2 or 3 days. High levels occur in other abdominal conditions, but a level higher than 280 per cent of normal when combined with a history indicative of acute pancreatitis is diagnostic. Later in the disease a high lipase level is important in diagnosis.

In the differential diagnosis acute cholecystitis, penetrating or perforated ulcer, intestinal obstruction, coronary disease, and mesenteric thrombosis must be considered since they may assume the appearance of late acute pancreatitis.

Management of acute pancreatitis should be directed toward relieving pain, reducing pancreatic secretory activity, preventing infection and peritonitis, controlling diabetes if present, and correcting fluid and electrolyte balance in order to prevent shock and maintain a satisfactory urinary output.

Pain may best be relieved with Demerol, atropine, or Banthine. Continuous gastric suction relieves gastric distention and reduces acid and gastric secretions entering the duodenum to a minimum. Continuous massive abdominal stupes often aid in reduction of abdominal distress and promotion of comfort. Paravertebral sympathetic, splanchnic, and fractional epidural blocks are all useful for severe pain which is not satisfactorily relieved by drugs. Antibiotics are helpful in combating infection; penicillin and streptomycin have been effective. Plasma, blood, and sodium chloride solutions should be administered in order to maintain an adequate urinary output by insuring an adequate blood volume. Blood sugar values should be kept within relatively normal limits so the pancreatic secretions will not be increased. In addition, constant supervision and repeated abdominal examinations are extremely important in conservative treatment, particularly of geriatric patients. A low fat diet should be prescribed for a long time, and Banthine should be continued indefinitely. All patients should be investigated for gallbladder disease since it is present in more than 70 per cent of patients with acute pancreatitis.

In this group of thirty-one patients there were three deaths.

A MECHANICAL AID TO WALKING
A Crab Crutch with a Universal Joint

A modified crab crutch which can be constructed easily and inexpensively is described by Borden Bachynski, M.D., in *The Journal of Bone and Joint Surgery,* October, 1953. The crutch was designed for young poliomyelitic patients unable to use the conventional crutch which because of one-point fixation on the ground is unstable when different angular thrusts are put on it.

A universal joint made of an ordinary shower head is inserted between a tripod and the crutch proper. The crutch proper is made of tubular metal which can easily be threaded and screwed into the shower head which is already tapped. The inner rubber gasket is removed, eliminating friction and producing a free-wheeling universal joint. As the crutch is swung forward, the tripod hangs directly down from the joint, grips the ground evenly, and compensates for any angular thrust which may be put on the crutch.

THE TREATMENT OF CHRONIC OSTEOMYELITIS

The need for excision of the infected sclerotic part of the bone, a method for dealing with resulting bone cavities, and the value of amputation and resection in chronic osteomyelitis are pointed out by T. Edward Wilson, M.D., in *Surgery, Gynecology and Obstetrics,* January, 1954.

Chronic osteomyelitis does not respond nearly so well to penicillin and other antibiotics as does acute osteomyelitis. During operation for chronic osteomyelitis, usually the only difficulty presented in excising the infected sclerotic bone occurs in cases in which complete removal would weaken the bone and present the possibility of a pathologic fracture. A limited resection should be done at the first operation and a further resection performed at a later date. The infected bone is cleaned until apparently normal, bleeding, cancellous bone is exposed all round. Postoperative immobilization of the limb

in a splint or plaster of paris cast is important no matter what method of treatment is used.

After pus, sequestra, infected bone and debris are removed, split-skin grafts, immediate and delayed, should be applied to the cavity wall. The cavity may also be filled with a muscle or fat graft or with cancellous bone chips and either immediately or later covered with a pedicle graft.

In order to prevent involucrum formation and to avoid problems associated with application of split-skin grafts to cavity walls, the author suggests that a mold of nonirritating and sterilizable material be kept in the wound during healing. If held in with sufficient pressure this prevents overgrowth of excessive granulation tissue. The mold should be of baked and glazed clay and should not be so tight as to interfere with drainage or with ingrowth of epithelium, but it should be big enough to keep the cavity open. This method of saucerization and mold insertion is especially suitable in recurrent chronic osteomyelitis of the shafts of superficial bones such as the tibia, radius, and ulna; it is not so satisfactory when the infection is located near the articular ends of the bones and in the deeper parts of bones such as the femur and humerus. If saucerization is impossible, a secondary opening in the opposite side of the bone may be made, thus allowing dependent drainage or changing the sinus site. After epithelium formation in a lower limb cavity, the mold is retained in place with slight pressure for a few weeks in order to prevent subepithelial edema.

Amputation is another valuable method of dealing with persistent and recurrent chronic osteomyelitis. A patient who has been invalided for years with no hope of any future improvement is better treated with amputation. Amputation is also indicated for patients whose limb will always be useless because of incurable deformity or intractable pain. It is also frequently an indication when suppurative arthritis, pathologic dislocations, nerve lesions, and secondary hemorrhages are complications of intractable chronic osteomyelitis. Malignancy in the sinuses of chronic osteomyelitis is rare, but it is an indication for amputation. Other cases which would result in great pain and incapacitation are often better treated by amputation.

Diaphysectomy of part or all of the affected bone is valuable in chronic osteomyelitis. The fibula is the bone best treated by this means; the clavicle, small bones of the hands and feet, ribs, and possibly the radius and ulna may sometimes be resected.

Book Notices

THE SURGERY OF INFANCY AND CHILDHOOD. Its Principles and Techniques. By Robert E. Gross, M.D., D.Sc., William E. Ladd Professor of Children's Surgery, The Harvard Medical School; Chief of Surgical Service, The Children's Hospital, Boston. Cloth. Pp. 1000, with illustrations. Price $16.00. W. B. Saunders Company, West Washington Sq., Philadelphia, 1953.

"What is children's surgery?" is the author's query in beginning his book. He is convinced that the surgery of infancy and childhood should not be set aside as a specialty, but at present it falls somewhere between the general physician and a surgical specialist, neither of whom regards the situation as being entirely within his sphere of work.

Dr. Gross' book represents a summarization of observations and results of operations on infants and children at The Children's Hospital of Boston. It records the forms of therapy and management which in practice have been the most suitable for handling various diseases and abnormalities.

A chapter each is devoted to Preoperative and Postoperative Care, Anesthesia for Pediatric Surgery, Surgery in Premature Infants, and Disruption of Abdominal Wounds. Other chapters are devoted to discussions of specific operations or operations on specific regions. Throughout the text the surgeon and anesthetist are cautioned about the difference in operative procedures between adults and children.

The text is profusely illustrated with photographs, x-rays, and drawings. Step-by-step illustrations of various operations are an important feature.

Physicians and surgeons who are called upon to perform surgery on infants and children will find this volume well organized, well written, and rich in practical information. It is an important addition to pediatric and surgical literature, and is the only authoritative text in the specific field. Its use will increase in value to each individual surgeon as he performs surgery on this special group.

FUNDAMENTALS OF CLINICAL CANCER With Emphasis on Early Diagnosis and Treatment. By Leonard G. Goldman, M.D., Clinical Professor of Radiotherapy, New York Medical College, Flower and Fifth Avenue Hospitals; Chairman, Tumor Conference and Director, Radiation Therapy Department, Queens General Hospital; Consultant Radiation Therapist, Flushing, Rockaway Beach and Triboro Hospitals, New York City. Cloth. Pp. 312, with illustrations. Price $8.75. Grune & Stratton, Inc., Medical Publishers, 381 Fourth Ave., New York 16, 1953.

"To suspect cancer and be wrong is pardonable—not to suspect cancer and be wrong may be fatal." This is the theme of the book intended for all physicians who diagnose and treat cancer. It attempts to set forth the fundamentals of early diagnosis and to recommend definite methods of treatment. Some mention is made of preventive measures.

Uppermost in the author's mind was the desire to write a book simply and concisely so that it would be suitable for quick reference and so that the subject of early cancer would not be obscured by material concerned with the advanced lesion. He has tried to limit the text and the illustrations, insofar as possible, to those lesions not too advanced to be controllable. Under the heading of treatment, *what to do* rather than *how to do it* has been emphasized, and the use of chemotherapy has been given considerable attention because the author feels that it will be used more and more.

In the Preface that author recognizes that there will be those who will take exception to some of his absolute statements and conclusions, but these, he reminds the reader, are based on his experience in treating 10,000 patients and are what he considers best for the majority of patients.

This text presents an eminently practical approach to cancer for the general practitioner, and it is recommended to all osteopathic physicians whose practice is such that they are likely to be the first to see patients with early lesions.

REGIONAL BLOCK. A Handbook for Use in the Clinical Practice of Medicine and Surgery. By Daniel C. Moore, M.D., Director, Department of Anesthesiology, Mason Clinic; Chief of Anesthesia, Virginia Mason Hospital, Seattle, Washington. Cloth. Pp. 373, with illustrations. Price $11.00. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1953.

The author states in his introduction that the "objective of this book is to present to the general practitioner and to the specialist, especially the embryonic anesthesiologist, a concise outline of the everyday phases of regional analgesia." This he has done adequately. It is an easy-to-read book giving step-by-step procedures, profusely illustrated, for the various types of nerve block.

World War II and Korean battle experiences proved the value of regional anesthetic methods, and this experience has been carried over into civilian practice. Today regional blocks are performed for diagnostic and therapeutic purposes as well as for anesthesia. It is essential, therefore, that the well-trained anesthesiologist be able to perform the commoner types of regional procedures. Of importance to the neophyte

is the detailed description of one successful method for each type of nerve block as performed in the author's clinic. This method obviates confusion and aids in obtaining competence in one technic.

Chapters 8 and 9 which deal with such basic topics as equipment and fundamental technic may be read with profit by any practitioner. While there may be personal disagreement with the author's preferred technic for certain procedures, giving heed to constant repetition and emphasis of important safety rules will minimize the inherent complications of regional block.

In general the text is carefully written and edited, but on page 163, in Fig. 123, the subject is photographed prone, but the descriptive text reads, "Note that the patient is in the supine position. . . ."

There is no bibliography, which does not detract in any way from the value of this book. As Dr. Moore states, "This text was designed to be a handbook and a quick source of information, not a reference book."

It is felt that this book would be of extreme value to any physician attempting to utilize regional blocking procedures.

A. A. GOLDEN, D.O.

CLINICAL ORTHOPAEDICS. Number One. Anthony F. DePalma, Editor-in-Chief. Cloth. Pp. 242, with illustrations. Price, single issue, $6.00; sustaining, $5.00. J. B. Lippincott Company, East Washington Sq., Philadelphia 5, 1953.

A new series of books on clinical orthopaedics is being launched. On the basis of the observation that with the growing scope of orthopaedic surgery and its numerous ramifications and continuous research resulting in ever-changing concepts in these fields, there is a need for additional outlets of material which, for lack of space, cannot be published in the existing journals. The editor has made plans to issue two or more volumes a year, sponsored by the Association of Bone and Joint Surgeons. Each volume is to be divided into a section which will deal with a specific topic, and a section which will carry miscellaneous articles on subjects of interest not only to orthopaedic surgeons but to surgeons in allied fields and general practitioners.

Children's Orthopaedics is the specific topic discussed in Volume I. Osteopathic physicians and surgeons will be interested in the chapters on Posture in Children and Interpretation and Treatment of Weight-Bearing Defects in Apparently Healthy Children. They will agree with the thesis that more and more attention needs to be given minor structural disorders in children. Of interest too will be those chapters which are devoted to the conservative management of scoliosis, infantile scurvy, and treatment of poliomyelitis based on pathophysiology.

Large type print placed in double columns makes for easy reading of the well-selected subject matter. Figures have reproduced well, and there are excellent photographs and drawings. References have been provided and the volume is indexed. This first issue of "Clinical Orthopaedics" gives promise of a valuable addition to current orthopedic literature.

AN ATLAS OF SURGICAL EXPOSURES OF THE EXTREMITIES. By Sam W. Banks, M.D., Associate Professor of Orthopaedic Surgery, Northwestern University Medical School; Attending Orthopaedic Surgeon, Chicago Memorial Hospital and Woodlawn Hospital; and Harold Laufman, M.D., Ph.D., Associate Professor of Surgery and Director of Experimental Surgery, Northwestern University Medical School; Associate Attending Surgeon, Michael Reese Hospital. Cloth. Pp. 391, with illustrations. Price $15.00. W. B. Saunders Co., W. Washington Sq., Philadelphia, 1953.

Visual presentations are valuable teaching aids and this picture atlas has been designed to serve the student and resident in surgery as an introduction to the most frequently used exposures of the extremities. Essentially a reference book, it may be used as well by the orthopedic surgeon and the general surgeon as a "refresher."

The illustrations are a result of a process which began in the laboratory. Dissections were made on cadavers, and each step of an exposure was photographed while a description of the procedure was dictated. The photographs depicting each surgical approach were then collated and the important structures labeled. The sets of photographs served as a basis for the drawings which are faithful representations of the anatomic findings encountered at surgery. Each illustration is accompanied by a concise and helpful description of each step of the surgical exposure which is preceded by a useful list of major indications.

The arrangement—descriptions on the left, drawings on the right—is convenient; the paper and type excellent. The atlas is recommended for those who wish descriptive material alone, for none of the surgical exposures are analyzed.

SURGERY OF THE PANCREAS. By Richard B. Cattell, M.D., Surgeon, The Lahey Clinic, New England Baptist Hospital, New England Deaconess Hospital; and Kenneth W. Warren, M.D., Surgeon, The Lahey Clinic, New England Baptist Hospital, New England Deaconess Hospital. Cloth. Pp. 374, with illustrations. Price $10.00. W. B. Saunders Company, West Washington Sq., Philadelphia, 1953.

Books which thoroughly discuss a limited field of surgery have become more and more abundant. Such books demand a summarization of all present knowledge referable to the subject—this, the surgery of the pancreas. They must be based on clinical research as well as important contributions made by other authorities.

Cattell and Warren have contributed effectively to the relatively new field of pancreatic surgery. Basing the book on experiences with over 1,000 patients with surgical diseases of the pancreas treated at the Lahey Clinic, a selected review of the case groups is utilized. Frequent reference has been made to surgical literature. The chapters on congenital malformations and pancreatic injuries are complete. Ever-changing concepts in surgical therapy are well illustrated by the discussions on carcinoma of the pancreas and the radical attack on pancreatic cysts and chronic relapsing pancreatitis.

The profusion of excellent diagrams of surgical procedures and reproductions of roentgenograms clarify various points set forth. Extensive bibliographies are given at the end of chapters.

Those interested in abdominal surgery will be most interested in this well-prepared book which is executed on paper of the highest quality utilizing a type which is easy to read.

HISTOLOGY. By Arthur Worth Ham, M.B., F.R.S.C., Professor of Anatomy, in Charge of Histology, in the Faculties of Medicine and Dentistry, University of Toronto, Toronto, Canada. Ed. 2. Cloth. Pp. 866, with illustrations. Price $10.00. J. B. Lippincott Company, East Washington Sq., Philadelphia 5, 1953.

Psychology has little to do with the subject matter of histology, but it has much to do with the problems of learning histology, the study which has been the chief basis, in reality, for our concepts of normal and disease processes. Dr. Ham has taken into account the common learning problems. He has done this by developing his book on the unit plan and subdividing the various sections for clearer organization of materials, by taking advantage of visual education including 518 figures, by correlating histology with many other subjects, by giving space to study in relation to trend of the times, and by evaluating the first edition through classroom use and incorporating the findings and suggestions in the second edition.

He has rewritten, revised, and added materials. Included are significant new findings on cell growth, differentiation, and cancer; on osteoclasts; on formation of fiber and the development, structure, and repair of tendons; the structure and growth of lung alveoli. Sections on the impulse-conducting

system of the heart, structure of lymphatics, and the adrenals have been added or rewritten. Bone growth as a whole has been considered, and repair and transplantation have been more fully treated.

This book constitutes a significant addition to the literature of histology, and because of the clear and interesting presentation seems destined to become a much used part of that literature. Its use is highly recommended.

FUNDAMENTALS OF CLINICAL ORTHOPEDICS. By Peter A. Casagrande, M.D., Orthopedic Department of Buffalo General Hospital, Buffalo Children's Hospital, and the University of Buffalo Medical School; Attending Orthopedist at the Chronic Disease Research Institute of the University of Buffalo, and the Veterans Administration Hospital, Buffalo, New York; and Harold M. Frost, Jr., M.D., Orthopedic Department of Buffalo General Hospital and the University of Buffalo Medical School, Buffalo, New York. Cloth. Pp. 582, with illustrations. Price $18.50. Grune & Stratton, Inc., Medical Publishers, 381 Fourth Ave., New York 16, 1953.

The teamwork of various orthopedic specialists has made available a detailed reference book which is a valuable contribution to the specialty. The complexity of clinical observations on disabilities of the musculoskeletal system has reached such great proportions that this book is an attempt to collect all information essential to the understanding of the fundamentals of orthopedics under one cover.

Through thoughtful organization, the authors have achieved their purpose. The basic science aspects are covered in preliminary chapters; pathologic aspects are subdivided according to the type of disease. The clinical descriptions are excellent.

The double-column pages set in easy-to-read type facilitate both study and reference work. Illustrations are excellent and aid in clarifying the text. A comprehensive index is included, but references and a bibliography are omitted.

THE BALLISTOCARDIOGRAM. A Dynamic Record of the Heart Beat. No. 143, American Lecture Series. By John R. Braunstein, M.D., Ph.D., Associate Professor of Biophysics and Assistant Professor of Medicine, University of Cincinnati, Cincinnati, Ohio. Cloth. Pp. 84. Price $3.00. Charles C Thomas, Publisher, 301-327 East Lawrence Ave., Springfield, Ill., 1953.

Ballistocardiography is a challenging and rapidly moving field in diagnostic medicine. This monograph, a record of two lectures delivered by Dr. Braunstein at the University of Cincinnati in 1951, surveys the history, present applications, and future trends of the ballistocardiogram. For the most part the book is concerned with the physical principles of the instrument and its physiologic applications. A chapter is devoted to clinical significance of the abnormal patterns and their relation to disease. Another chapter is devoted to the vectorballistocardiogram—its concept, theory, design and construction, results and conclusions. Some of the physical and mathematical characteristics of the instruments used are discussed in some detail in the appendix. A bibliography and an index complete the monograph which may be used as a reference work for those who have a basic understanding of the subject.

SURGICAL FORUM. Proceedings of The Forum Sessions, Thirty-Eighth Clinical Congress of The American College of Surgeons, New York City, September, 1952. Cloth. Pp. 716, with illustrations, charts and figures. Price $10.00. W. B. Saunders Company, West Washington Sq., Philadelphia, 1953.

A reference book of eminent value is this compilation of papers presented at the Forum Sessions of the Thirty-Eighth Clinical Congress of the American College of Surgeons. It records the recent research done in laboratories in the United States and Canada concerning almost every surgical specialty and including preoperative and postoperative care. The 129 papers cover research on stomach, heart and great vessels, heart and blood circulation, gynecology, obstetrics, lungs and liver, shock, water balance and electrolytes, blood coagulation, plastic surgery, and others.

Dr. O. H. Wangensteen, chairman of the Surgical Forum Committee, and his committee members have done an excellent job of editing these papers authored by nearly 350 researchers. The majority of the papers follow this outline: method, results, discussion, summary and conclusion, and references. The material covered is a mine of information for all in the medical field and is liberally illustrated with photographs, drawings, and charts.

The volume represents the current results of the interest of young men in the basic sciences as related to surgery. The justification of their research depends on the extent to which their results can be applied to a better understanding of surgical disease and its therapy. Every surgeon and every surgical resident should own and study this volume to the end that he can translate into his own work the advances made by others.

GASTRIC CANCER. By Alfred H. Iason, M.D., Attending Surgeon, Adelphi Hospital; Director of Surgery, Brooklyn Hospital for the Aged; Surgeon, Manhattan General Hospital; Instructor in Anatomy, New York Medical College and Flower Hospital. Cloth. Pp. 316, with illustrations. Price $7.50. Grune & Stratton, Inc., Medical Publishers, 381 Fourth Ave., New York 16, 1953.

Based on a summarization of the cumulative literature concerning gastric cancer, this monograph is designed to bring interns, residents, and practitioners up to date on the subject and to intensify their awareness regarding prevention and early detection of cancer. Although there is little attempt at critical review, it provides a great many practical suggestions, and in general includes all the basic principles applicable to gastric cancer. There are chapters on anatomy, histology, etiology, pathology, symptomatology, diagnosis, anesthesia, surgical treatment, and complications.

CONDUCTION ANESTHESIA. By George P. Pitkin, M.D., F.A.C.S., F.I.C.A. Edited by James L. Southworth, M.D., F.A.C.S., Formerly Senior Surgeon, U.S.P.H.S.; Formerly Co-Director, Cardiovascular Clinic, Public Health Service Hospital, Baltimore, Maryland; Attending Surgeon, East Tennessee Tuberculosis Hospital and East Tennessee Baptist Hospital, Knoxville, Tennessee; Robert A. Hingson, M.D., F.A.C.A., F.I.C.A., F.I.C.S., F. (Faculty of Anes.) R.C.S. (England), First Director Anesthesia, Women's Division (Philadelphia Lying-In Hospital) of Pennsylvania Hospital; First Professor of Anesthesia, University of Tennessee School of Medicine; Formerly Senior Surgeon, U.S.P.H.S.; Formerly Associate Professor of Obstetrics, Johns Hopkins University; Professor of Anesthesia, Western Reserve University, Cleveland, Ohio; Winifred M. Pitkin, M.A. (Oxon.), B.M., B.Ch. (Oxon.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), M.D., Assistant in Surgery to the late George P. Pitkin. Cloth. Pp. 1005, with illustrations. Price $22.50. J. B. Lippincott Company, East Washington Sq., Philadelphia 5, 1953.

The late Dr. George Pitkin was stimulated to begin his study of local and block anesthesia shortly after his start in practice in 1908. He soon observed that general anesthesia as it was then performed was often harder on the patient than the surgery itself. The results of his years of experience and study were evident in the first edition of "Conduction Anesthesia" which was published in 1946. It received an appreciative welcome from surgeons and anesthesiologists, and this second edition should be even more popular because of revisions and additions.

The chapter on the pharmacology of drugs utilized in anesthesia has been revised, and drugs infrequently used have been omitted. Chapter 20 which deals with the complications of conduction anesthesia—causation, prevention, and treatment—is most timely. The section dealing with extradural anesthesia, either the single dose or the fractional method, has been brought up to date.

Those familiar with the first edition will miss some of its illustrations in this new and better edition.

Despite the increasing safety and facility of present-day general anesthesia, conduction anesthesia is widely employed, and this text is a most useful reference for anesthesiologists, surgeons, and other practitioners concerned with its use.

A. A. GOLDEN, D.O.

TREATMENT OF RESPIRATORY EMERGENCIES, INCLUDING BULBAR POLIOMYELITIS. By Thomas C. Galloway, M.D., Professor Emeritus of Otolaryngology, Northwestern University Medical School; Attending Otolaryngologist, Evanston Hospital, Evanston, Illinois; Formerly, Attending Otolaryngologist, Cook County Hospital, Chicago, Illinois. Cloth. Pp. 94, with illustrations. Price $3.00. Charles C Thomas, 301-327 E. Lawrence Ave., Springfield, Ill., 1953.

Written and edited by men who are eminent in the field of otolaryngology this monograph, another in the American Lecture Series, emphasizes and thoroughly discusses the indications for tracheotomy and the technic for its use, although the title suggests full treatment of all facets of respiratory emergencies. The need for early recognition of the deleterious effects of respiratory obstruction and anoxia and the need for relief of obstruction before permanent defects result have been set forth.

Briefly outlined are the mechanics of obstruction and the pathophysiology of anoxia; discussed at length are the factors incident to the care of patients with poliomyelitis; completely described are indications and technics for tracheotomy.

Written in an informal manner with reference to many personal experiences this well-prepared monograph based on considerable study of the underlying physiopathology may be read quickly and would benefit all physicians interested in this phase of respiratory disease. An extensive bibliography is included.

HYPERPARATHYROIDISM. By B. Marden Black, M.D., Associate Professor of Surgery, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota, and Division of Surgery, Mayo Clinic, Rochester, Minnesota. Paper. Pp. 119, with illustrations. Price $3.75. Charles C Thomas, Publisher, 301-327 East Lawrence Ave., Springfield, Ill., 1953.

This monograph, which is another in the American Lecture Series in Endocrinology, attempts to present all the information necessary to diagnose and treat hyperparathyroidism successfully. The Mayo Clinic series of proved cases of hyperparathyroidism, which numbered 112 through 1949, was used as a basis for the review.

The internist, roentgenologist, pathologist, surgeon, and urologist, who are all important in case finding and treatment, as well as the general practitioner, will find this monograph a valuable addition to their medical libraries.

CLINICAL DIAGNOSIS BY LABORATORY METHODS. A Working Manual of Clinical Pathology. By James Campbell Todd, Ph.B., M.D., Late Professor of Clinical Pathology, University of Colorado School of Medicine; Arthur Hawley Sanford, A.M., M.D., Emeritus Professor of Clinical Pathology, The Mayo Foundation, University of Minnesota; Emeritus Member, Division of Clinical Laboratories, The Mayo Clinic; Director of Laboratories, Rochester State Hospital; and Benjamin B. Wells, M.D., Ph.D., Professor of Medicine, Department of Medicine, School of Medicine, University of Arkansas. Ed. 12. Cloth. Pp. 998, with illustrations. Price $8.50. W. B. Saunders Co., W. Washington Sq., Philadelphia, 1953.

No doubt many JOURNAL readers are familiar with the preceding eleven editions of "Clinical Diagnosis by Laboratory Methods." When a book reaches its twelfth edition it has attained a position as a standard text and reference book. Restricting its contents to established procedures has been responsible in part for this distinction.

Because the eleventh edition of the text was completely revised, no drastic changes, either in content or chapter subdivisions, have been made in this volume. However, new material has been added to the chapter on blood, and changes have been made in the chapter on urine. In order to provide recognized and uniform methods for the clinical laboratory the chapter on serologic tests for syphilis has been revised as well as the chapter on bacteriologic methods.

The appendix on various standard solutions, tables of normal values, the index-outline of laboratory findings in important diseases, and the complete index are exceedingly useful for analysis, verification, and interpretation of the various clinical diseases.

THE ANATOMY OF THE NERVOUS SYSTEM. Its Development and Function. By Stephen Walter Ranson, M.D., Ph.D., Late Professor of Neurology and Director of Neurological Institute, Northwestern University Medical School, Chicago. Revised by Sam Lillard Clark, M.D., Ph.D., Professor of Anatomy, The Vanderbilt University School of Medicine, Nashville. Ed. 9. Cloth. Pp. 581, with illustrations. Price $8.50. W. B. Saunders Company, West Washington Sq., Philadelphia, 1953.

Now appearing in its ninth edition, Clark's revision of Ranson's standard textbook, which first appeared 33 years ago, aims to blend the account of structure with function in such a way as to aid students and practitioners in increasing their understanding of how the nervous system is made up and how it works. Emphasis is laid on the developmental and functional significance of structure; the importance of the details of developmental neurologic anatomy is particularly stressed.

Although the sequence and titles of the twenty-one chapters have not been changed, additions have been made in each section in accordance with the results of current neurologic research. Thus we find the chapter on neurons and neurolgia revised because of structural findings and the chapter on cerebral cortex revised because of functional discoveries. Both of these chapters, as well as others throughout the text, summarize many of the recent findings in laboratory research. Osteopathic physicians will be particularly interested in the well-illustrated chapter on the meninges and blood vessels of the central nervous system.

Two instructional sections have been retained: the Sections of the Brain which is composed of illustrations accompanied by brief descriptive text, and a Laboratory Outline of Neuroanatomy which gives directions for the study of the gross and microscopic anatomy of the nervous system.

Ample illustrations, an up-to-date bibliography, and an index generously supplied with cross references contribute to the usability of this text for those in medical and psychologic fields.

SIDE EFFECTS OF DRUGS. By L. Meyler, Consulting Physician at Groningen (Netherlands). Translated by Ph. Vuijsje and W. Mulhall Corbet, Amsterdam. Cloth. Pp. 268. Price $5.00. Elsevier Press, P.O. Box 6175, Houston 6, Tex., 1952.

With thousands of drugs on the market, many of a synthetic nature which are complicated in structure and very different from the natural elements of the body, the possibility of untoward side effects has become more prevalent. Because the author has observed harmful effects from the indiscriminate use of drugs he has endeavoured to collocate all the known facts regarding the side effects in a concise form.

Dr. Meyler has achieved his goal as the book is practical and functional in its organization. The material covered is based on extensive observations from widely different sources, gathered by a systematic literature research. Each drug is discussed in relation to its action upon the body systems, and is classified according to the drug groups—drugs acting on the central nervous system, the autonomic nervous system, and the cardiovascular system; analgetics; antipyretics; anesthetics, skeletal muscle relaxants, vitamins, hormones, and others.

Extensive bibliographies are provided at the end of chapters and there are a comprehensive table of contents and index.

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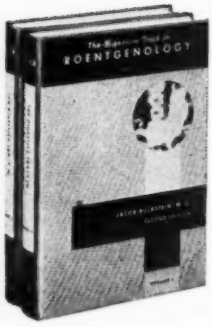

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Conventions and Meetings

Announcements

American Osteopathic Association, Fifty-Eighth Annual Convention, Royal York and King Edward Hotels, Toronto, Canada, July 12-16, inclusive. Program Chairman, Campbell A. Ward, 51 Cass Ave., Mt. Clemens, Mich.

American College of Osteopathic Internists, annual meeting, Philadelphia, October 7-10. Secretary, Glennard E. Lahrson, 460 Staten Ave., Oakland 10, Calif.

American College of Osteopathic Pediatricians, Region I, annual Spring meeting, Hotel Statler, New York, March 26. Program Chairman, Arnold Melnick, 7247 Charles St., Philadelphia. Secretary, Samuel L. Caruso, 2837 W. Alleghany Ave., Philadelphia.

American College of Osteopathic Surgeons, annual meeting, Hotel Baker, Dallas, Tex., October 31-November 4. Administrative Secretary, Mrs. O. F. Martin, Box 474, Coral Gables 34, Fla.

American Osteopathic Academy of Orthopedics, annual meeting, Hotel Baker, Dallas, Tex., October 31-November 4. Secretary, J. Paul Leonard, 2673 W. Grand Blvd., Detroit 8. Program Chairman, Walter R. Garard, 809 S. Hobart Blvd., Los Angeles 5.

American Osteopathic College of Anesthesiologists, annual meeting, Hotel Baker, Dallas, Tex., October 31-November 4. Secretary, Crawford M. Esterline, Box 155, Kirksville, Mo. Program Chairman, Armin L. Karbach, 316 N. Center, Arlington, Tex.

American Osteopathic College of Radiology, annual meeting, Hotel Baker, Dallas, Tex., October 31-November 4. Secretary, H. Miles Snyder, Art Centre Hospital, 5435 Woodward Ave., Detroit 2. Program Chairman, John H. Pulker, Flint Osteopathic Hospital, 416 W. Fourth Ave., Flint 4, Mich.

American Osteopathic Hospital Association, annual meeting, Hotel Baker, Dallas, Tex., October 31-November 4. Executive Secretary, Mr. Robert P. Chapman, 1011 Kahl Bldg., 326 Third St., Davenport, Iowa.

American Osteopathic Society of Proctology, annual meeting, Hotel Jefferson, St. Louis, Mo., April 29-May 1. Secretary, Carl S. Stillman, Jr., 3523 Fifth Ave., San Diego 3, Calif. Program Chairman, Felix D. Swope, 609 Farragut Medical Bldg., Washington 6, D. C.

Arizona, annual meeting, Santa Rita Hotel, Tucson, May 7-9. Secretary, Homer E. Allshouse, 2243 N. 12th St., Phoenix 22. Program Chairman, Spencer Ellsworth, 101 W. Ajo Way, Tucson.

Arkansas, annual meeting, Sam Peck Hotel, Little Rock, April 26-27. Secretary, R. M. Packard, 110 E. Huntington Ave., Jonesboro. Program Chairman, C. W. Dalrymple, 318-20 Exchange Bldg., Little Rock.

California, annual meeting, Hotel Del Coronado, Coronado, May 23-26. Executive Secretary, Mr. Thomas C. Schumacher, 1298 Wilshire Blvd., Los Angeles.

Child's Health Conference, Municipal Auditorium, Kansas City, Mo., April 5-7. Program Chairman, Floyd E. Dunn, 926 E. 11th St., Kansas City, Mo.

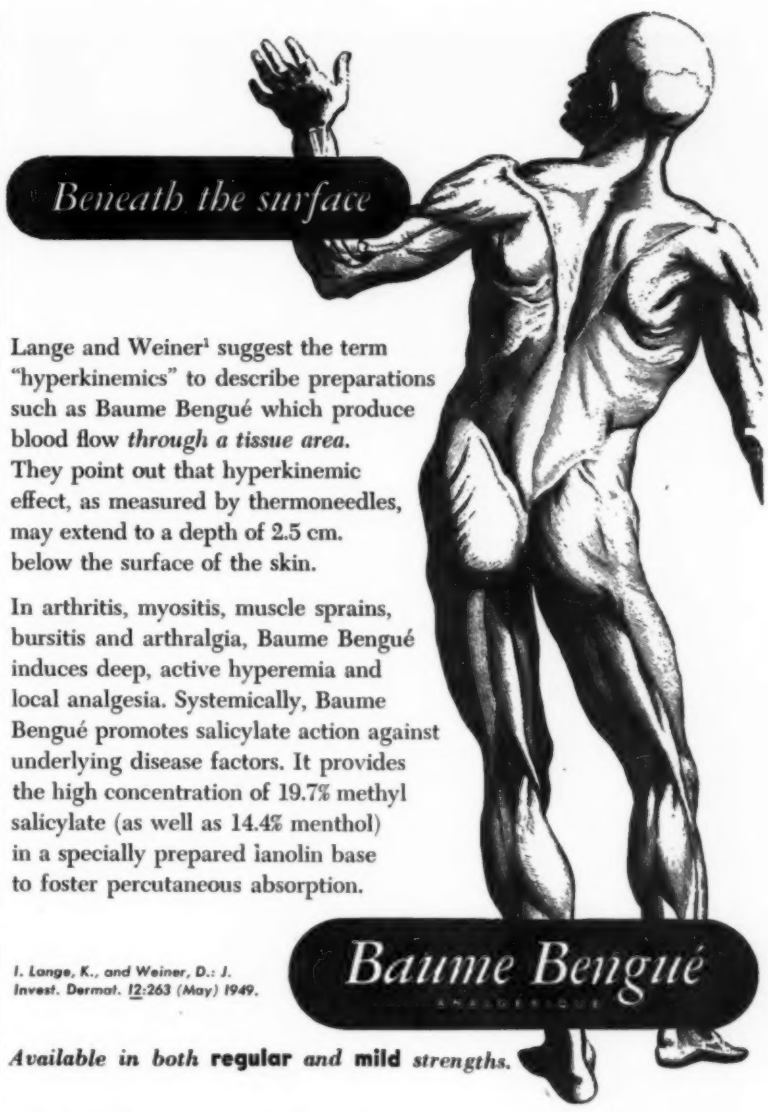
Colorado: See Rocky Mountain Osteopathic Conference.

Florida, annual meeting, Monte Carlo Hotel, Miami Beach, May 13-15. Secretary, Dominic Raffa, 5009 Central Ave., Tampa 3. Program Chairman, William E. White, Manatee Post Office Arcade, Bradenton.

Georgia, annual meeting, Radium Springs, May 7-8. Secretary, Kenneth H. Wiley, 806 Mortgage Guarantee Bldg., Atlanta 3. Program Chairman, Chan L. Plair, 901 Second Ave., Albany.

Hawaii, annual meeting, Honolulu, October 25-27. Secretary, Joseph W. Stella, 38 Young Hotel Bldg., Honolulu 9. Program Chairman, Charles D. Lake, 546 Young Hotel Bldg., Honolulu 9.

Illinois, annual meeting, Pere Marquette Hotel, Peoria, May 2-4. Executive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Lange and Weiner[1] suggest the term "hyperkinemics" to describe preparations such as Baume Bengué which produce blood flow through a tissue area. They point out that hyperkinemic effect, as measured by thermoneedles, may extend to a depth of 2.5 cm. below the surface of the skin.
In arthritis, myositis, muscle sprains, bursitis and arthralgia, Baume Bengué induces deep, active hyperemia and local analgesia. Systemically, Baume Bengué promotes salicylate action against underlying disease factors. It provides the high concentration of 19.7% methyl salicylate (as well as 14.4% menthol) in a specially prepared lanolin base to foster percutaneous absorption.
1. Lange, K., and Weiner, D.: J. Invest. Dermat. 12:263 (May) 1949.
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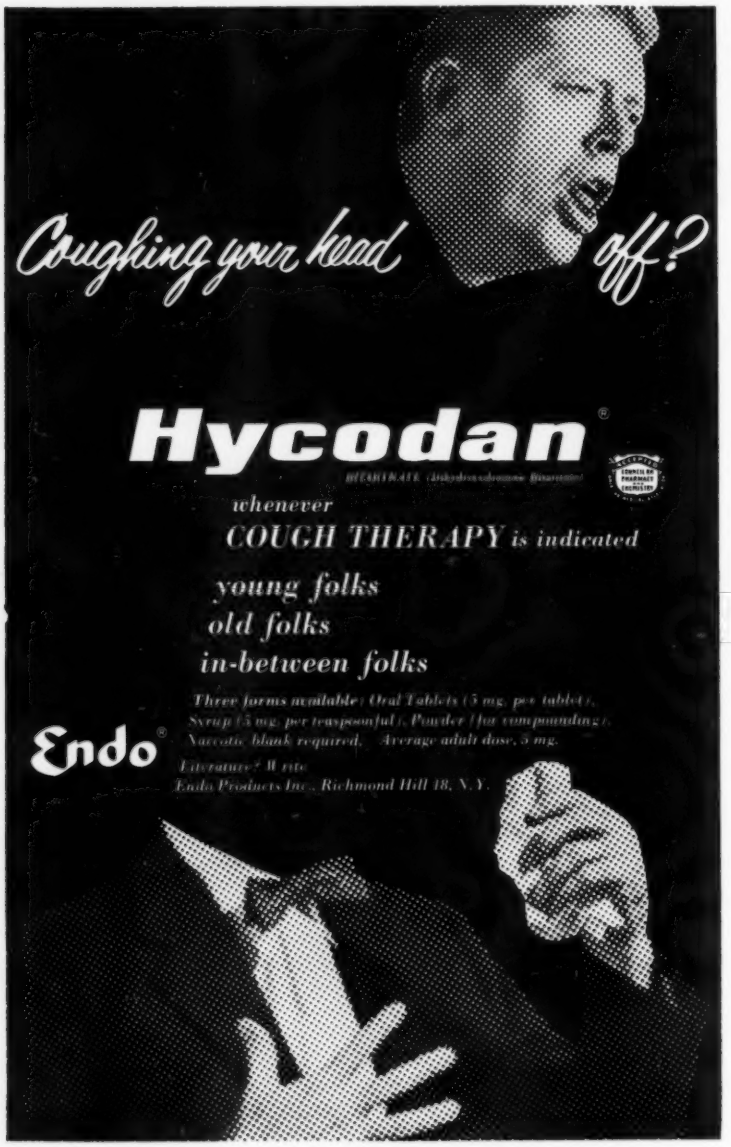
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Secretary, Mr. Douglas Durkin, 5200 E. Ellis Ave., Chicago 15.

Indiana, annual meeting, South Shore Inn, Lake Wawasee, Syracuse, May 9-11. Secretary, F. A. Turfler, Jr., 107 S. William St., South Bend.

Iowa, annual meeting, Hotel Savery, Des Moines, May 23-25. Secretary, Mr. Dwight S. James, 200 Walnut Bldg., Des Moines 9. Program Chairman, John Q. A. Mattern, 806-07 Savings & Loan Bldg., Des Moines 9.

Kansas, annual meeting, Allis Hotel, Wichita, April 24-28. Executive Secretary, Mr. Lloyd L. Hall, Room 612, National Bank of Topeka Bldg., Topeka. Program Chairman, Robert G. Waddill, 2914 E. Central, Wichita 6.

Kentucky, annual meeting, Brown Hotel, Louisville, September 29-30. Secretary, Harold D. Benteen, 2048 Winchester Ave., Ashland. Program Chairman, Martha Garnett, 417 Fincastle Bldg., Louisville 2.

Maine, annual meeting, Hotel Samoset, Rockland, June 17-19. Executive Secretary, Roswell P. Bates, 72 Main St., Orono.

Michigan, annual meeting, Civic Auditorium, Grand Rapids, October 4-6. Secretary, P. Ralph Morehouse, 214 S. Superior St., Albion. Program Chairman, B. F. Dickinson, 222 E. Sixth St., Royal Oak.

Minnesota, annual meeting, May 7-8. Secretary, E. R. Komarek, 301 Granite Exchange Bldg., St. Cloud.

Missouri, annual meeting, Hotel Colonial and Kentwood Arms Hotel, Springfield, October 13-15. Executive Secretary, Mr. Paul D. Adams, 325 E. McCarty St., Jefferson City. Program Chairman, L. R. Morgan, 3014 S. Main St., Joplin.

New Hampshire, annual meeting, Milville Inn., Concord, May 10. Secretary, Edna C. Waterhouse, Intervale Road, North Conway. Program Chairman, George W. Draper, Jr., 233 Central Ave., Dover.

New Jersey, annual meeting, Essex House, Newark, March 20-21. Executive Secretary, Mr. I. J. Tecker, 21 Hancock St., Riverside. Program Chairman, George W. Northup, 104 S. Livingston Ave., Livingston.

New Mexico, annual meeting, Franciscan Hotel, Albuquerque, April 29-May 1. Secretary, Robert E. Smith, 205 N. First, Lovington.

New York, annual meeting, Hotel Syracuse, Syracuse, October 15-16. Secretary, Robert E. Cole, 417 S. Main St., Geneva. Program Chairman, Allen S. Prescott, 800 Keith Theatre Bldg., Syracuse 2; co-chairman, Francis J. Beall, Jr., 1429 James St., Syracuse 6.

North Carolina, annual meeting, Battery Park Hotel, Asheville, October 21-23. Secretary, S. Dales Foster, 710 Public Service Bldg., Asheville. Program Chairman, Elizabeth E. Smith, 18 Wall St., Asheville.

North Dakota, annual meeting, Hotel Gardner, Fargo, May 7-8. Secretary, Georgianna Pfeiffer, 110½ Broadway, Fargo. Program Chairman, Gregory S. Mallarian, 1140 Broadway, Fargo.

Northwest Osteopathic Convention, annual meeting, Chinook Hotel, Yakima, Wash., June 21-23. Program Chairman, Wilbert B. Saunders, 4730 University Way, Seattle 5, Wash.

Ohio, annual meeting, Neil House, Columbus, May 2-5. Executive Secretary, Mr. William S. Konold, 50 E. Broad St., Columbus. Program Chairman, Donald J. Ulrich, 141 E. Main St., Kent.

Oklahoma, annual meeting, Biltmore Hotel, Oklahoma City, November 8-10. Executive Secretary, Mr. Walter L. Gray, 210-212 Braniff Bldg., Oklahoma City.

Oregon: See Northwest Osteopathic Convention.

Osteopathic College of Ophthalmology and Otorhinolaryngology, annual meeting, Hotel Statler, Detroit, July 7-9. Executive Secretary, Mr. William S. Konold, 50 E. Broad, St., Columbus, Ohio. Program Chairman, C. P. Harth, 616 S. Main St., Tulsa 3, Okla.

Pennsylvania, annual meeting, Penn Harris Hotel, Harrisburg, September 24-26. Program Chairman, Harry E. Binder, 7247 Charles St., Mayfair, Philadelphia 35. Executive Secretary, Mr. George W. Thomas, 510 N. Third St., Harrisburg.

Rocky Mountain Osteopathic Conference, midyear meeting, Broadmoor Ho-

tel, Colorado Springs, Colo., November 12-14. Secretary, C. Robert Starks, 1459 Ogden St., Denver 18.

South Dakota, annual meeting, Hotel Sawnee, Brookings, June 6-8. Secretary, Earl W. Hewlett, 417 W. 27th St., Sioux Falls. Program Chairman, Carl C. Pascale, Box 36, Centerville.

Tennessee, annual meeting, Holiday Inn, Memphis, April 4-7. Secretary, L. D. Chesemore, 715 Morton St., Paris. Program Chairman, L. D. Elliston, 707 S. Main St., Covington.

Texas, annual meeting, Texas Hotel, Fort Worth, April 29-May 1. Executive Secretary, Phil R. Russell, 1837 Hillcrest Ave., Fort Worth 7. Program Chairman, Lester Hamilton, 5725 Camp Bowie Blvd., Fort Worth 7.

Utah and Wyoming, joint annual meeting, Logan, Utah, June 26-27. Secretary, Utah Society of Osteopathic Physicians and Surgeons, Alice E. Houghton, 600 Zion's Savings Bank Bldg., Salt Lake City 1. Secretary, Wyoming Association of Osteopathic Physicians and Surgeons, G. A. Roulston, 2823 Central St., Cheyenne. Program Chairman, Wilford G. Hale, 506 W. 2nd South, Logan, Utah.

Virginia, annual meeting, Williamsburg, May 28-29. Secretary, E. Brooks Flickinger, 301 W. Whitlock St., Winchester. Program Chairman, Vincent H. Ober, 407-11 Bankers Trust Bldg., Norfolk 10.

Washington: See Northwest Osteopathic Convention.

West Virginia, annual meeting, Daniel Boone Hotel, Charleston, June 6-8. Secretary, Guy E. Morris, 542 Empire Bank Bldg., Clarksburg. Program Chairman, Donald C. Newell, 137½ Main St., Oak Hill.

Western States Osteopathic Society of Proctology, annual meeting, Shamrock Hotel, Houston, Tex., October 4-6. Secretary, E. F. Walters, 925 E. South Temple St., Salt Lake City 2.

Wisconsin, annual meeting, Hotel Pfister, Milwaukee, April 12-14. Secretary, Edwin J. Elton, 1518 N. 70th St., Wauwatosa 13. Program Chairman, E. G. Anderson, 51 S. Franklin St., Janesville.

Wyoming: See Utah.

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State and National Boards

ARIZONA

Those interested in professional examinations should contact Russell Peterson, D.O., secretary, Board of Registration and Examination in Medicine and Surgery, 2747 East McDowell Road, Phoenix.

Basic science examinations June 15, University of Arizona, Tucson. Applications must be filed 2 weeks prior to examination. Address Herbert D. Rhodes, Ph.D., secretary, Basic Science Board, University of Arizona, Tucson.

COLORADO

Meeting at Denver April 13. Applications for licenses by reciprocal-endorsement must be filed by March 13. Address Miss Beulah H. Hudgens, executive secretary, Board of Medical Examiners, 831 Republic Bldg., Denver 2.

Basic science examinations in March and May. Address Esther B. Starks, D.O., secretary, Basic Science Board, 1459 Ogden St., Denver 18.

CONNECTICUT

Basic science examinations June 12, Room 23, Lampson Hall, Yale University, New Haven. Applications must be filed 2 weeks prior to examination. Address Miss M. G. Reynolds, executive assistant, Board of Healing Arts, 52 Whitney Ave., New Haven 10.

DISTRICT OF COLUMBIA

Professional examinations May 10-11. Basic science examinations April 19-20, 1740 Massachusetts Ave., N. W., Washington. Applications must be filed no later than April 1. Address Mr. Paul Foley, deputy director, Department of Occupations and Professions, 1740 Massachusetts Ave., N. W., Washington 6.

FLORIDA

Professional examinations in June. Address R. Philip Coker, D.O., secretary, Board of Osteopathic Medical Examiners, 602 E. 4th St., Panama City.

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Basic science examinations in June. Applications must be filed 15 days prior to examination. Address M. W. Emmel, D.V.M., secretary, Board of Examiners in the Basic Sciences, P.O. Box 340, Gainesville.

IDAHO

Examinations June 10 at Boise. Address Mr. Britt Nedry, director, Occupational License Bureau, Department of Law Enforcement, Room 354, State House, Boise.

ILLINOIS

Examinations April 6-8, 160 N. LaSalle St., Chicago. Applications must be filed at least 2 weeks prior to the examinations. Address Judge Vera M. Binks, director, Department of Registration and Education, Springfield.

IOWA

Basic science examinations April 13, Capitol Bldg., Des Moines. Applications must be filed prior to examination. Address Ben H. Peterson, Ph.D., secretary, Board of Basic Science Examiners, Coe College, Cedar Rapids.

KENTUCKY

Examinations June 7-9, Henry Clay Hotel, Louisville. Address Mrs. Ray Wunderlich, director, Medical Licensure and Registration, Board of Health, 620 S. Third Street, Louisville.

MAINE

Examinations June 8 at Augusta. Address George F. Noel, D.O., secretary, Board of Osteopathic Examination and Registration, Monument Sq., Dover-Foxcroft.

MARYLAND

Examinations in June. Address Christopher L. Ginn, D.O., secretary, Board of Osteopathic Examiners, 419 N. Charles St., Baltimore 1.

MICHIGAN

Basic science examinations May 14-15. Address Mrs. Anne Baker, secretary, Board of Examiners in the Basic Sciences, 410 W. Allegan, Lansing.

MINNESOTA

Basic science examinations April 6-7 and June 1-2, 101 Wesbrook Hall, University Campus, Minneapolis. Applications must be filed by the 10th of the month preceding examination. Address Raymond N. Bieter, M.D., secretary, Board of Examiners in the Basic Sciences, 105 Millard Hall, University of Minnesota, Minneapolis 14.

MISSISSIPPI

Examinations in June. Address R. N. Whitfield, M.D., assistant secretary, Board of Health, Jackson.

NEBRASKA

Basic science examinations May 4-5. Address Mr. Husted K. Watson, director, Bureau of Examining Boards, Department of Health, State Capitol Bldg., Lincoln 9.

NEVADA

Basic science examinations April 6, Room 215, Mackay Science Bldg., University of Nevada, Reno. Applications must be filed by March 23. Address Donald G. Cooney, secretary, Board of Examiners in the Basic Sciences, Box 9005, University Station, Reno.

NEW JERSEY

Examinations June 15. Address E. S. Hallinger, M.D., secretary, Board of Medical Examiners, 28 W. State St., Trenton.

NEW MEXICO

Basic science examinations April 18. Address Mrs. Marguerite Cantrell, secretary, Board of Examiners in the Basic Sciences, Box 1522, Santa Fe.

OHIO

Examinations June 14-16 at Columbus. Address H. M. Platter, M.D., secretary, Medical Board, Wyandotte Bldg., Columbus 15.

OKLAHOMA

Basic science examinations April 16-17, University of Oklahoma School of Medicine Auditorium, Oklahoma City. Applications must be filed 10 days prior to examination, if possible. Address the Secretary of State.

OREGON

Basic science examinations June 5 at Portland. Address John R. Richards, secretary, State Board of Higher Education, Eugene.

RHODE ISLAND

Professional examinations April 1-2. Professional examinations must be preceded by basic science examinations. Basic science examinations May 12. Applications must be filed 20 days prior to the examinations. Address Mr. Thomas

B. Casey, Administrator of Professional Regulation, 366 State Office Building, Providence.

SOUTH CAROLINA

Examinations June 15 at Columbia. Address Nancy Hoselton, D.O., president, Board of Osteopathic Examiners, 1711 Gervais St., Columbia 1.

SOUTH DAKOTA

Basic science examinations first week in June. Address Gregg M. Evans, Ph.D., 310 E. 15th St., Yankton.

TENNESSEE

Examinations in February and July at Nashville. Applications must be filed 15 days prior to examination. Address M. E. Coy, D.O., secretary, Board of Examination and Registration for Osteopathic Physicians, 1226 Highland, Jackson.

TEXAS

Examinations at the meeting June 21-23, Texas Hotel, Fort Worth. Reciprocity applications must be complete 30 days prior to the meeting date. Address M. H. Crabb, M.D., secretary, Board of Medical Examiners, 1714 Medical Arts Building, Fort Worth 2.

WISCONSIN

Basic science examinations April 3 at Assembly Chamber, State Capitol, Madison. Applications must be filed by March 26. Basic science examinations will also be given June 5 at Hotel Schroeder, Milwaukee. Applications must be filed by May 28. Address William H. Barber, secretary, Board of Examiners in the Basic Sciences, 621 Ransom St., Ripon.

WYOMING

Examinations June 7 at Cheyenne. Address Franklin D. Yoder, M.D., secretary, Board of Medical Examiners, New State Office Bldg., Cheyenne.

REREGISTRATION OF OSTEOPATHIC LICENSES

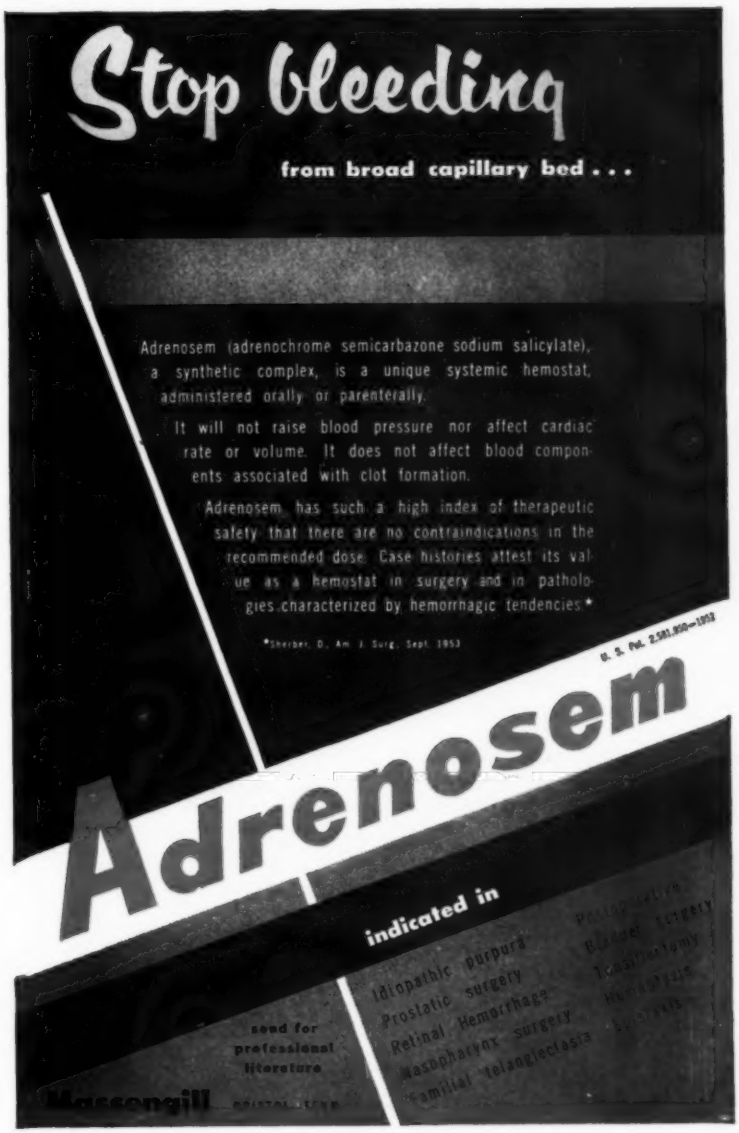
April 1—Montana, $2.00 for those in active practice; $1.00 for those inactive. Address Asa Willard, D.O., secretary, Board of Osteopathic Examiners, Wilma Bldg., Missoula.

April 1—Wyoming, $2.50. Address Franklin D. Yoder, M.D., secretary, Board of Medical Examiners, New State Office Bldg., Cheyenne.

May 1—Iowa, $1.00. Address W. S. Edmund, secretary, Board of Osteopathic Examiners, 621 Third St., Red Oak.

May 1—Washington, $2.00. Address Edward C. Dohm, secretary, Professional Division, State Department of Licenses, Olympia.

During June—Hawaii, $5.00 for residents, $2.00 for nonresidents. Address Frank O. Gladding, D.O., secretary, Board of Osteopathic Examiners, 504 Kauikeolani Bldg., Honolulu 13.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EXAMINATION BY NATIONAL BOARD

The National Board of Examiners for Osteopathic Physicians and Surgeons conducts Parts I and II of its examination on the first Thursday and Friday of each May and December at the six approved colleges. Application blanks may be obtained from the secretary or the dean of the college, and the completed application blank, together with a passport photograph and check for the parts to be taken, must be in the secretary's office by the November 1 or April 1 preceding the examination.

Examinations in Part I consist of anatomy, including histology and embryology; physiology; physiological chemistry; general pathology; and bacteriology, including parasitology and immunology.

Part II consists of examinations in surgery, including applied anatomy, surgical pathology, and surgical specialties; obstetrics and gynecology; pediatrics; neurology and psychiatry; public health, including hygiene; medical jurisprudence; osteopathic principles, therapeutics, including pharmacology and materia.

Part III is an oral and practical examination given in Philadelphia, Chicago, Kirksville, and Los Angeles under the supervision of a chief examiner who is a member of the Board and by a panel of associate examiners. Subjects covered in Part III are anatomy; physiology; pathology; osteopathic principles, therapeutics, and pharmacology; surgery; ophthalmology and otorhinolaryngology; obstetrics and gynecology; physical and

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clinical diagnosis; public health and communicable diseases.

The following Part II examinations are scheduled:

Philadelphia	March 13-14
Kirksville	March 13-14
Chicago	April 3-4
Los Angeles	May 1-2

These are oral examinations which the candidate may take after having satisfactorily completed the first 6 months of a 1-year internship in a hospital approved by the American Osteopathic Association for intern training. Part III is given annually at the above-named colleges.

Eligibility requirements are as follows: Part I, satisfactory completion of the first 2 years in an approved school of osteopathy; Part II, satisfactory completion of Part I and of the first two quarters or trimesters of the senior year in an approved osteopathic college; Part III, satisfactory completion of Part II and at least 6 months of a 1-year internship approved by the American Osteopathic Association. The internship requirement does not apply to candidates who took Part I prior to July, 1950.

Application must be filed with the secretary of the Board not less than 30 days prior to the examination dates. Address Paul van B. Allen, D.O., secretary, 1512 N. Delaware Street, Indianapolis 2, Indiana.

FEDERAL-STATE PARTNERSHIP: PROBLEMS IN ADMINISTRATION, RESEARCH, AND PRACTICE*

By Leonard A. Scheele, M.D.
Surgeon General of the Public Health Service

This Conference of the Public Health Service and the Children's Bureau with the States and Territories will go down in history as a momentous one. For the first time, the many governmental activities which concern you and us directly or indirectly have been brought together in an executive department of the Federal Government. For the first time, our mutual aspirations for the health of people everywhere, and our mutual problems are represented in the President's Cabinet by our first Secretary of Health, Education, and Welfare.

The completion and operation of the Clinical Center of the Public Health Service set another landmark in public health since last we met. I would predict that the nationwide research effort, in which the Center is destined to be a dynamic force, will produce, sooner than we think, findings capable of turning public health work upside down. The great revolutionary findings of the nineteenth century in the field of bacteriology and related disciplines brought public health into being as a scientific profession, and those same findings revolutionized the practice of medicine. Medical research is on the verge of remarkable advances in our knowledge of chronic diseases, viral diseases, and mental diseases, as well as in our basic understanding of the human organism and its functioning.

I predict that the new findings will give preventive medicine a greater force in the medical arts and sciences than it has ever had in the past. At the same time, the new findings will turn public health practice as we know it today—upside down. Our role of supporting clinical practice will take on new significance.

There are many interesting new features in the Clinical Center's physical plant, as well as many challenging research studies. Each project is designed to throw new light on some facet of diseases which are killing or disabling large numbers of people everywhere. The studies on metabolic balance in rheumatoid arthritis, on hypertension, and on hormone-producing tumors may seem remote from the activities of a public health department. The end results, however, may be of immediate concern to you and your staffs.

The mass cripplers and killers must ultimately be prevented by simple methods. Some may criticize this concept, but I insist that this is the goal of research and of medicine. Let us take, for example, certain common forms of arteriosclerosis: If we find that certain alterations in metabolism lead to arteriosclerosis—as studies reported by the National Heart Institute suggest—and if we can then find a chemical means of blocking such metabolic dysfunction, we

*Reprinted from *Public Health Reports*, January, 1954.

may have a preventive technique as important to medical and public health practice as was the discovery of vitamin C in the prevention of scurvy and of vitamin D in the prevention of rickets. This may seem like a dream, but I believe we are on the threshold here at the Clinical Center and elsewhere in the United States of just such important discoveries.

CONTROL OF NONINFECTIOUS DISEASES

We may also find methods capable of mass application for the prevention of some noninfectious diseases. Who would have thought, in 1943 for example, that a technique for treating the water supply to control a noninfectious disease would be discovered, developed, and put to work in nearly 800 American communities within a decade? I refer, of course, to the fluoridation of public water supplies for the reduction of dental caries in children. During the past year, the eighth annual examination of school children in Grand Rapids, where fluoridation was first applied, showed the same excellent results of past years.

The significance of the fluoridation story is this: By a single method we are able to combat a noncommunicable disease that currently costs the Nation at least half a billion dollars annually in dental bills plus untold amounts in lost time and in the ill effects of dental decay on personal health. The fluoridation of public water supplies does not prevent all caries, but it will eliminate a major segment of the problem. A goal of public health in communicable disease control has been at least to reduce a specific infection to manageable proportions. We are now learning how to accomplish the same goal in noncommunicable diseases.

It is not only possible, but probable, that the greatly intensified research program throughout our Nation will produce new, simple, and relatively inexpensive methods for community-wide attacks on far more serious diseases than dental decay. The work on environmental factors in the causation of cancer, for example, may one of these days produce the evidence and the methods we need for a forthright attack on cancerigenic agents in the environment. By this means, we might directly prevent the occurrence of a significant number of cancer cases.

APPLYING PRINCIPLES OF PREVENTION

We sometimes find it difficult to realize that the broad principles of prevention, environmental control and preventive therapy, may be just as applicable to the chronic diseases, mental illness, and traumatic causes of death and disability, as to dysentery, diphtheria, and whooping cough. At a recent staff meeting in the Public Health Service, we heard that a case of hoof-and-mouth disease had been reported from one of the States. All the machinery of diagnosis, confirmation, and search for the source of infection had, very properly, been set in motion. Eventually, the resources of other State health departments, the Public Health Service, and Federal-State departments of agriculture also will be drawn into the search and control effort.

I could not help remembering that every day nearly 2,000 people in the United States die of cardiovascular diseases; 575 others die of cancer; and 240 more die in accidents. Yet the combined daily loss of some 2,800 lives from these 3 major causes alone all too often creates no such surge of concern and action as does the occurrence of a few cases of a rare infectious disease.

CONTROL OF CHRONIC DISEASES

Actually, some of the available methods for the control of chronic diseases are far less crude and costly than are the available methods for preventing the spread of hoof and mouth disease. The prevention of rheumatic fever—especially of its cardiac sequelae—is a case in point. The preventive therapy now available with sulfa drugs and antibiotics is certainly more effective and less expensive than earlier methods of controlling scarlet fever, for example. The channels for its application are the very ones that public health officers and private physicians together opened for the application of immunization against diphtheria, smallpox, and typhoid fever 50 years ago; and again for the diagnosis and treatment of syphilis 35 years ago.

CHANNELS OF COOPERATION

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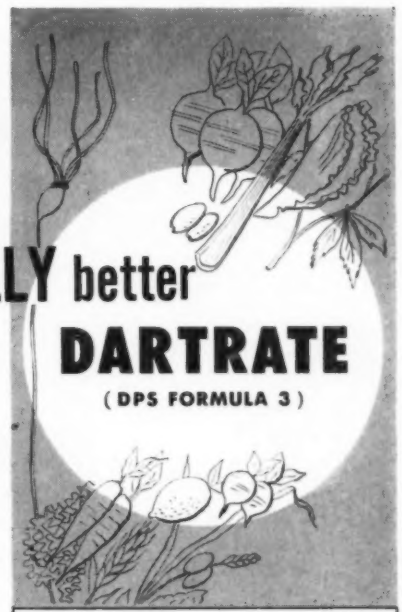

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cooperation between the health agency and the practicing physicians, and between them and the voluntary agencies, the hospitals, the schools, and other community facilities, however, are the same. And it is the foremost challenge to the State and local health departments to pick up the spade and do the ground breaking in opening up these channels of cooperation.

The health officer and his staff cannot take over the practice of medicine, nor is it their desire to do so. Ours is the challenge, however, to work with our colleagues in private practice, in medical organizations and specialty societies, so that a higher level of national health can be attained. Cooperation and teamwork for health should be the watchwords of all members of the health professions, regardless of the setting in which they work. Learning how to cooperate is one of the great problems before us and the extent to which we seriously explore and develop techniques of cooperation will be the real measure of our fulfillment of the trust we hold. This is true for all of us, whether we be general practitioners, specialists in private practice, hospital administrators, dentists, nurses, or public health administrators.

There should be no conflict of interests. Rather there should be harmony of interest. This assignment calls for developing our skills in the art of cooperation to the highest possible degree. It calls for imagination, persistence, and patience. All of the health professions need especially to bring to bear creative thinking on how to go about developing cooperative action for the prevention of chronic disease. We in public health and our colleagues in private practice have grown up professionally with certain established patterns of organization and operation.

The problems which confront us today cannot be solved in an identical framework in all communities. Perhaps what we need most at the present time is some communities with bold thinkers who will dare to conceive and test new patterns of organization and operation for the control of chronic disease. The communities that can come forward with such thinking may well be the pacesetters for future progress in public health.

FEDERAL-STATE RELATIONS

Consideration of the Nation's major health problems invites consideration of the future relations of the Public Health Service with the State and Territorial health officers and their staffs, the hospital, and the mental health authorities. The issue of Federal financial grants to the States in all fields is receiving the most serious attention at the highest levels of our Government. Mr. Rockefeller has described the Commission on Intergovernmental Relations, which will be concerned with governmental functions and fiscal resources, established by Congress last July. The Department of Health, Education, and Welfare also has set up a special intradepartmental task force to cooperate with the staff of the commission. All of us are working to the end that the President's aim may be reached: namely, that the programs "be made more effective instruments serving the security and welfare of our citizens."

The question of financial grants is only one of many to be considered by the commission. However, it is certainly one of transcendent importance to the States and communities who will have to make the final decisions as to whether the services now supported in part by Federal grants are to be continued and maintained at effective levels.

If the Nation's health authorities will reflect on these developments, they will find that it requires a fresh look at the purposes of Federal grants and at the means for implementing health programs in the States and local communities. The tendency in the past has been to expect the continuation of a given grant program, whatever its category, general health, maternal and child health, venereal disease control, and so on. More and more the States should try to provide funds to cover programs once aided by Federal grants. This will free Federal funds for new programs.

VENEREAL DISEASE CONTROL

Many of the State health officers will recall that Congress developed the very first "categorical grant" program—venereal disease control—on the principle of increasing State responsibility. The war period and the subsequent addition of other categorical programs have tended somewhat to obscure that principle. Many officials in public health, hospital construction, and mental health programs have not realized that the time would come when definite program appraisal and planning for the assumption of financial responsibility would be in order.

Our cooperative venereal disease control activity provides an example of what can be done to keep a categorical program dynamic—moving toward the goal for which it was created. In 1938, the Nation's health and medical authorities assured Congress that it was possible to bring venereal disease under control throughout the United States in a generation, or about 25 years. World War II with its accompanying increased spread of venereal infections would have set back the schedule many years had it not been for two fortunate situations: first, the swift action on the part of Federal, State, and local health agencies to set up a going program; and second, the advent of penicillin, which climaxed many years of research.

TIMETABLE FOR CONTROL

The State and the Public Health Service have never lost sight of the original goal. When the project grant program was initiated, State and Federal staffs jointly worked out a timetable for bringing venereal disease under control in each State. Twenty-four States had attained their goal by the close of the fiscal year 1953.

The timetable calls for control in the remaining States by the close of specific years, up through 1963. The Public Health Service and the armed services hope to provide continuing resources for handling the venereal disease problem in areas where direct Federal responsibility is clearly indicated. After 1963, the target year for control of venereal disease throughout the United States, the Federal Government's responsibility should be limited to surveillance against the interstate spread of disease, as in other infections under control.

This goal can be reached but only if the States pick up their share of the burden. It will be a tragedy—nay, a disgrace—if after so many years of successful cooperative effort, after the pledge of public health to the Nation to control venereal disease, we do not attain this goal.

It may be that we cannot at the present time "pinpoint" the attainment of other public health goals with the precision we have achieved in venereal disease control. But the States and the Public Health Service should make it their joint concern and persistent effort. Your responsibility and ours is to render an account to the public of what we expect to accomplish, how we expect to attain the goals, and when. We need clear delineation of Federal and State responsibilities, including delineation of the need for Federal financial aid and State support.

FINANCES AND PRACTICAL APPRAISALS

All of us realize that the combined current expenditures, Federal, State, local, and voluntary, for public health work in the United States falls far short of the amount needed to provide health services which will give the people the full advantages of modern medical and public health science. In looking ahead, therefore, we must go beyond the static concept of maintaining State and local health services at the current level. The public health, hospital construction, and mental health authorities will need to make it clear to their legislatures and their citizens that a mere replacement of reductions in Federal health grants will not be enough. More than replacement is needed if the American people are to attain higher levels of health in the future.

Additional expenditures of themselves, however, do not insure progress. Of equal importance is a more effective use of funds. Last year, I emphasized the need for a comprehensive appraisal of current public health practices, with a view to providing more effective local health services.

INVENTORY STUDIES

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1. Cass, L. J. and Frederik, W. S.: Malt Soup Extract as a Bowel Content Modifier in Geriatric Constipation. Journal-Lancet, 73:414 (Oct.) 1953.

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from time to time; but few have measured the results of specific practices and procedures. Only by careful observation and study of local programs in various community settings will it be possible to develop reliable criteria for the improvement of current practices. Only through such studies can we test the comparable effectiveness of new and old procedures.

The Public Health Service has made tentative plans for such a study, and it is gratifying that some States and communities are preparing to inventory their programs in terms of current needs and to appraise their administrative practices. The data from these new-type inventories will be useful in connection with our study of public health practices. A complete stock-taking of Public Health Service activities and operations in the Federal-State cooperative programs also is underway. As we anticipated, the job is not easy. Our guideline is: how to get more for each tax dollar in a reduced budget, without sacrificing quality of service.

The new Hoover Commission, the Commission on Organization of the Executive Branch of the Government, is a second high policy-level group that will be concerned with health programs and organization. The commission will have eight task forces, including the following of special interest to you, the Public Health Service and the Children's Bureau; water and power resources; Government medical services; personnel and Civil Service; and accounting and budget procedures. Mr. Hoover has appointed Chauncey McCormick of Chicago as chairman of the Government Medical Services Task Force.

The scope of the second Hoover commission's mandate is considerably wider than that of the first. The first commission was restricted to proposals for reorganization and realignment of existing functions. The second is authorized to recommend abolishment of functions and activities not considered necessary to the Government, and the elimination of nonessential services, functions, and activities which compete with private enterprise. It may also recommend specific legislation.

Mr. Hoover has set December 31, 1954, as a target date for completion of the commission's legislative recommendations. Some of these may be ready early in 1954, however.

WATER RESOURCES AND POLLUTION CONTROL

The proposals of the commission on water resources will be of special interest to health officials. The critical situation which now faces the entire country is familiar to all of you. In a special message to Congress, July 31, the President emphasized the need for a sound national program of conservation, improvement, wise use, and development of both land and water resources. He also stated his belief that such a program can be achieved through cooperation among the States, local communities, private citizens, and the Federal government.

The States have made impressive advances in water pollution control in the past 5 years, but even greater accomplishments are needed if the Nation is to keep pace with the demands of increasing population and industrial production. By far the largest and most serious pollution problem is that of industrial wastes. We do not yet know the precise effects of chemicals in water on human health. We have not yet developed sufficient methods for eliminating these waste products. The production and use of chemicals—new and old—have vastly increased in recent years. The Nation's health authorities are in a position to aid water conservation programs, as well as the control of pollution, by increasing their vigilance over water uses and practices which impair the basic sources of supply and at the same time are potential hazards to public health.

RADIATION PROBLEMS

We are making progress in the study of radiation problems. Two State health departments, California and New Jersey, in particular are going forward with pilot programs for the control of radiation hazards. Several cooperative programs have been established between the Atomic Energy Commission and the Public Health Service. The Service has recently had a special team which maintained liaison with the Atomic Test

Group and the States. A public health team has done a most creditable job this year in monitoring fallout of atomic debris in areas up to 200 miles from the test site.

HOME ACCIDENT PREVENTION

I am especially pleased to report progress in yet another "new" public-health program—home accident prevention. The W. K. Kellogg Foundation has awarded grants to eight States for the conduct of statewide demonstrations in this field, on recommendations of the Public Health Service. The Foundation based its extension of support on the success of the 4 local demonstrations initiated 2 years ago. The Service will cooperate with the States in their demonstrations, as we have in the local projects.

The Public Health Service has been fostering this interest in home accident prevention for the past 3 years. We have been able to assemble an enthusiastic and well-qualified team to assist in the design and conduct of demonstrations. The activity is giving our organization and State and local health departments valuable experience in how to develop needed new programs through cooperation with voluntary agencies, private foundations, and universities.

The Public Health Service has been the catalyst and technical consultant. The States and communities participating in the program have recognized a need and want to do something about it. A private foundation has provided the funds for finding out how to do the job. The National Safety Council has been an active participant and a valuable spearhead. The University of Michigan School of Public Health played host to the first National Conference on Home Accident Prevention, sponsored by the council and the Public Health Service, last January. Perhaps this is a design for public health progress in some other areas, and a role that the Service should play in other new and challenging fields in the years ahead.

Highway accidents also maim hundreds of people and take a major toll in lives every day. Voluntary and official agencies are deeply concerned with this problem, yet few official health agencies serve as consultants to the interested groups, or play any role in helping stem the tide of accidents. Technical advice on physical standards for drivers' licenses and on safety engineering is a fertile field for health department cooperation.

OTHER ENVIRONMENTAL PROGRAMS

For the first time, the Public Health Service has a small sum allocated in the 1954 appropriations for assisting the States in the certification of interstate milk shippers. During the past 2 years, 395 shippers, representing 30,000 producers in 33 States and the District of Columbia, have been certified by the States. A year from now we expect that approximately 600 shippers, representing 50,000 producers, will be participating in this program.

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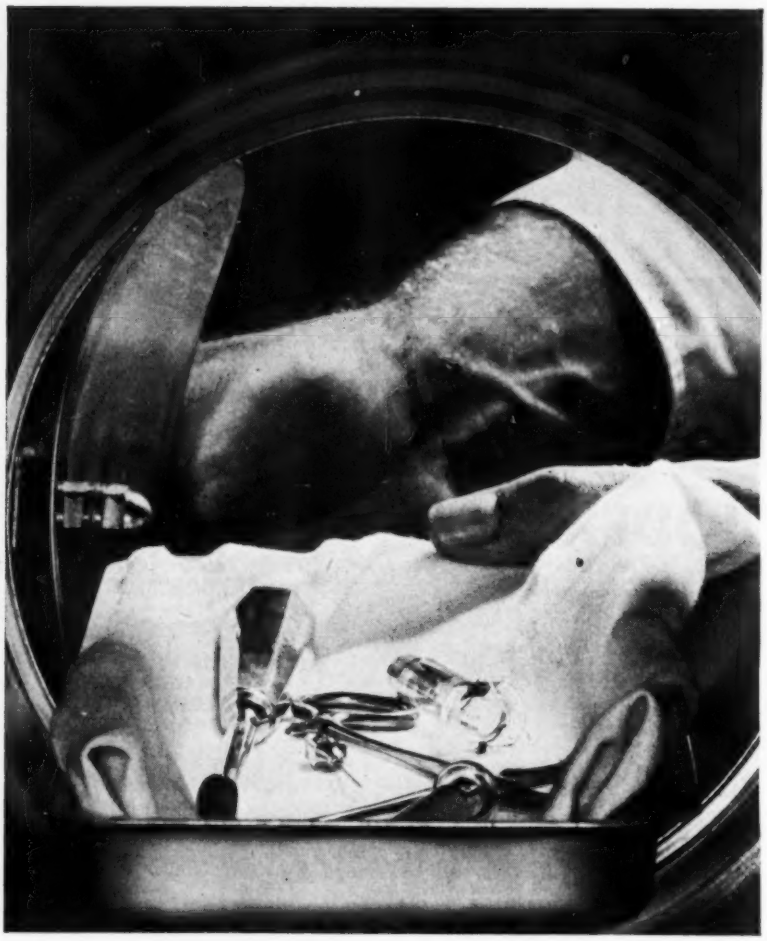
Work has been completed on the first section of the Poultry Ordinance and Code, which we have been developing with the States and representatives of the poultry and poultry-products industries. The industries are concerned, as we health workers are, that about one-fourth of all reported outbreaks of "food poisoning" are traced to poultry or poultry products. This fact tends to cause some communities to adopt regulations that serve, in effect, as trade barriers, but not always as adequate protection for the public. A guide to regulations that will both safeguard public health and permit the widest possible distribution of essential foods should be a good springboard for improvement in this area.

EMERGENCY ACTIVITIES

One of the most important events of the past year was the adoption of a formal agreement by the Public Health Service and the American Red Cross regarding cooperation in time of disaster. A copy of the agreement was forwarded to you with the agenda of this conference and will be a subject of further discussion tomorrow. The Service and the Red Cross recognize that really effective handling of disaster problems can be accomplished only by the State and local people. The State health officers can do more than any other single group to promote such effective handling of disasters in their jurisdictions.

I wish to commend the State and Territorial health officers—each and every



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one—for the highly successful operation of the emergency gamma globulin distribution program this summer. Between May 15 and October 1, nearly 3,750,000 cc. of gamma globulin for polio were allocated to the States under policies established by the Office of Defense Mobilization, on recommendation of the National Research Council, the Association of State and Territorial Health Officers, and other national groups and individuals. Mass prophylaxis programs, requiring more than 1,600,000 cc. of gamma globulin, were conducted in 23 local communities in the continental United States and in Juneau, Alaska. Approximately 231,000 children were inoculated in the mass programs.

Whatever epidemiologic investigation and scientific appraisal may indicate regarding the effectiveness of gamma globulin in the control of paralytic poliomyelitis, we can feel real gratification that national, State, and local agencies have demonstrated their ability to apply new operating procedures to a traditional public health problem—epidemic control.

In the gamma globulin program, the health officer found himself in a position opposite to his usual role. He had to restrict the use of the material rather than devote his efforts to the promotion of increased application of a public health measure. Despite the difficult, controversial, and potentially unpopular nature of the assignment, no health officer declined to take the responsibility. The Public Health Service's civilian requirements staff functioned effectively in meeting the requirements of the States. There was marked improvement in the reporting procedures.

ANTIPOLIOMYELITIS VACCINE

Our success in jointly conducting such a "different" nationwide activity has proved again that Federal-State-voluntary cooperation in the health field is strong, reliable, and able to take new responsibilities in stride. The National Foundation for Infantile Paralysis is now asking your cooperation in large-scale testing of a killed-virus antipoliomyelitis vaccine. If studies to date are confirmed in a larger test series, the vaccine may provide an effective immunizing agent which will eliminate large-scale use of gamma globulin against paralytic polio.

HEALTH OF MIGRANT WORKERS

There are plenty of unresolved problems on our doorstep that need joint action among ourselves and with our colleagues in related fields, such as education, welfare, vocational rehabilitation, law enforcement, agriculture, and others. We need the help of our colleagues especially in solving such problems as health services for migrant workers. Doctor Eliot has discussed this problem with you. She and I are particularly gratified at the interest and constructive thinking demonstrated by a number of State health officers with respect to migrant worker's health.

HOSPITAL CONSTRUCTION

You will recall that, in the approval of projects under the Hospital Survey and Construction Act, the so-called "split project" technique has been utilized for several years. The technique was designed to permit the approval of large projects, which because of their high cost, would absorb all of a given State's annual allotment, or even exceed it. By spreading the Federal participation over successive fiscal years, it was believed that such projects could be financed without jeopardizing the intended initiation of new construction throughout the country.

At the last session of Congress, there was adverse comment regarding the split project technique. As a result, with the approval of the Secretary, the Public Health Service is issuing a revised split project policy. The effect of the revision will be to limit the approval of such projects to sums not to exceed two-thirds of the equivalent of the Federal appropriation for 1954 in the fiscal year 1955, and to one-third of the same in 1956. In addition, applicants for split projects will hereafter be required to demonstrate their ability to complete a usable facility in the event of reductions in, or failure of, Federal appropriations. Members of the Public Health Service are discussing this new policy with State health and hospital authorities during this meeting.

PERSONNEL PROBLEMS

Personnel shortages continue acute in many categories. I regret to say that the shortage of medical public health administrators has grown more critical during the past year. Clinical practice continues to attract most young physicians. I hope that our colleagues in private practice and in the medical associations will increasingly recognize the serious problems which face public health and that they will join us in an aggressive campaign to fill some of the gaps.

SANITARY ENGINEERS

In the fields of sanitary engineering and nursing resources, several interesting projects have been completed. They will be useful in helping meet some of the shortages in these categories. The Public Health Service, for example, has completed a study designed to discover why such a high proportion of the sanitary engineers leave the field for which they were trained in college. It now appears that the majority who leave the field do so immediately after graduation; that is, they fail to enter the field. They lack information about specific job openings. We hope that some way will be found to inform the college seniors of all the jobs available to them in sanitary engineering.

NURSING AIDES

The American Hospital Association, the National League for Nursing, and the Public Health Service have prepared a manual of simple nursing procedures for the training of nursing aides. Originally, the Health Resources Advisory Committee of the Office of Defense Mobilization urged the Service to investigate the need for training of these hospital workers. As you know, there are more than 200,000 auxiliary nursing personnel employed in the Nation's hospitals. Most of them have had no preparation. The "learn-as-you-go" training they get is time consuming, as is the constant supervision they require from professional nurses.

The new Handbook for Nursing Aides in Hospitals will be off the press about December 1. At that time, the National League for Nursing will begin a series of regional institutes to teach key nurses in local areas how to use the handbook and to apply the methods of instructing nursing aides which it introduces. I hope that the State health officers and hospital authorities will help extend the training of nursing aides by sending one or more of your nursing consultants to the regional institutes when they are announced in your areas.

The need for health manpower in the United States technical assistance programs overseas also continues to be acute. President Eisenhower has emphasized the importance of these programs, and we call on all of you to rotate some of your staff through tours of duty in international health services.

Last year, we solicited your cooperation in having State health departments

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sponsor health missions overseas. We realized that there would be many legal and regulatory difficulties to overcome, so we are pleased that three States have taken definite action.

URGES CRITICAL APPRAISAL

We also wish to express our gratitude, and that of our colleagues overseas, for the splendid work the State health officers, their staffs, and local health authorities have done this year for the thousands of foreign students and visitors in our country. You have contributed immeasurably to our Nation's foreign relations by your warm and continuing interest in these neighbors from the free world who came to study and observe our American health services. I assure you that your understanding and friendship are sincerely appreciated by the men and women whom you have helped.

I am sure that many public health workers in the States and Territories, as well as in the Federal services, are wondering how they can make the admittedly inadequate nationwide expenditure for health purposes do a bigger job and a better job in the face of rising costs, some reductions in financial support, and continuing personnel shortages.

I am sure that we can do a bigger job in spite of some adversity, and I believe that all of us can do a better job. The people in our States and communities must learn to look to their State and local governments and their voluntary agencies for additional support of the services which reach them directly. All of us must learn how to be more efficient in the utilization of available funds. We all need to do a little soul searching. Critical appraisal of our practices and projects may well reveal economies that will make it possible to do a better job in our traditional public health activities, as well as to start some new programs. It will help us to eliminate repetition of long-outmoded programs and practices. In so doing, we will be able to launch a successful attack on the major causes of ill health; an attack planned and carried out in an atmosphere of full cooperation and trust by all professional groups, official and voluntary—and without official control and dictation. Such an attack will bring us closer to our great goal—higher levels of health for the American people in their communities.

AGENDA FOR A CRITICAL EXPLORATION OF CURRENT PROBLEMS IN MEDICAL CARE*

By E. M. Bluestone, M.D.

Here is a catechism—but with questions only. The author draws here upon his extensive experience in hospital administration and his pioneering work at Montefiore Hospital in New York to ask, cogently and incisively, the perplexing questions current today in the fields of hospital and medical services administration. When originally presented last December his audience was United Community Services of Metropolitan Detroit, but his "agenda" is for all who plan and direct the course of health and medical affairs in private and governmental hospitals, in public health, in social service, and in the civic and official organizations of the community. From them the answers must come.

The modern student of medical care seems almost to be laboring under an embarrassment of riches these days, so much successful experimental material is at his disposal. Social and medical possibilities are clamoring for conversion into actualities at such a rapid pace that the planner is left breathless in the process. We shall have to excuse his enthusiasm on the one hand and his disappointment on the other when he finds the going slow. Opposition must be met, satisfied, or overcome. New problems are sometimes created as old ones are solved. The best example of this seeming paradox is found in the lengthening of the life span, which, however desirable, brings with it the necessity for making the later years comfortable. The problem in procedure is therefore how to apply new remedies for old difficulties and how to find additional remedies—an unending chain.

*Reprinted from *Public Health Reports*, December, 1953.

The most extensive, and perhaps the most difficult, of the basic problems is the one the patient exhibits when he is suffering from prolonged illness, whether he is ambulatory, bedridden, or alternating between the two. Here is an exceptional case in which the solution of one major problem automatically liquidates a great many others. Relieve the chronic difficulty and the acute difficulty will be relieved in the process. Since one of the penalties of greater longevity is that it takes a longer average time to die than ever before, we are all the more constrained to deal with this manifestation intensively. That the approach is social, economic, and political, as well as medical, goes without saying. The family and the environment play a major role in any consideration of such a subject. Preventive medicine and environmental medicine hold many keys that are ready for use.

Listed here are some of the items on the agenda of unfinished business, with explanatory notes, for the consideration of the participants as they deliberate such questions at the council table. Each of these items calls for decisive action and each requires a combination of social and medical techniques in research, which are at our disposal, ready for study and application.

1. We need a definition of such terms as "acute," "chronic," "convalescent," "custodial," "aged," "hospital," "home," "curable," "incurable," "social medicine," and "socialized medicine." At the moment, the sick man suffers patiently while those who plan for him too frequently permit themselves to be confused by these terms.

At what point, for example, shall we separate acuteness from chronicity? Can we establish a common denominator for the two and use it for all practical purposes? What is the impact of duration of illness on the provision of medical care, and does the service correspond to the requirements of the case? How is a convalescent patient distinguished from a so-called chronic patient? Is there any advantage in providing for the elderly separately and apart from all other social and medical services? Or is it better to identify them with all other age groups in accordance with their social and medical needs? When are we justified in labeling a patient "custodial" with regard to medical care? At what point, if any, during the course of illness is a hospital justified in dismissing a patient and transferring him to less capable hands?

It is easy to see how hospital policy can be revised and formulated on a more equitable basis when such questions are answered correctly and in absolute terms in relation to each other.

2. The trends in medical care for each of these definitions needs stating, particularly with reference to prolonged illness (formerly known hopelessly as chronic disease) and the aging process. Most of these are well known, even though we resist their full acceptance, while others still wait to be brought to public view in a practical way. There is, for example, the continuing trend toward finding new ways of closing the gaps in hospitals between (*a*) acute and chronic; (*b*) income and expenditure; (*c*) space demand and space supply; (*d*) social service and medical service; (*e*) intramural and extramural care; (*f*) current medical economics and the science of medicine; and (*g*) principle and practice generally.

This involves the consideration of such things as voluntary prepaid insurance plans, including group medical practice; home care for those who do not require a hospital bed; and substitutes for the patient's home under the medical jurisdiction of the hospital for those who do not require a hospital bed and cannot be taken care of in their own homes, either immediately or by subsidy of one kind or another. The outpatient department's services will have to be considered; provision of doctors' office space on hospital premises; the integration of tuberculosis and mental disease in the work of the general hospital; the principle of full-time medical service in hospitals; the shifting emphasis in medical education; and the

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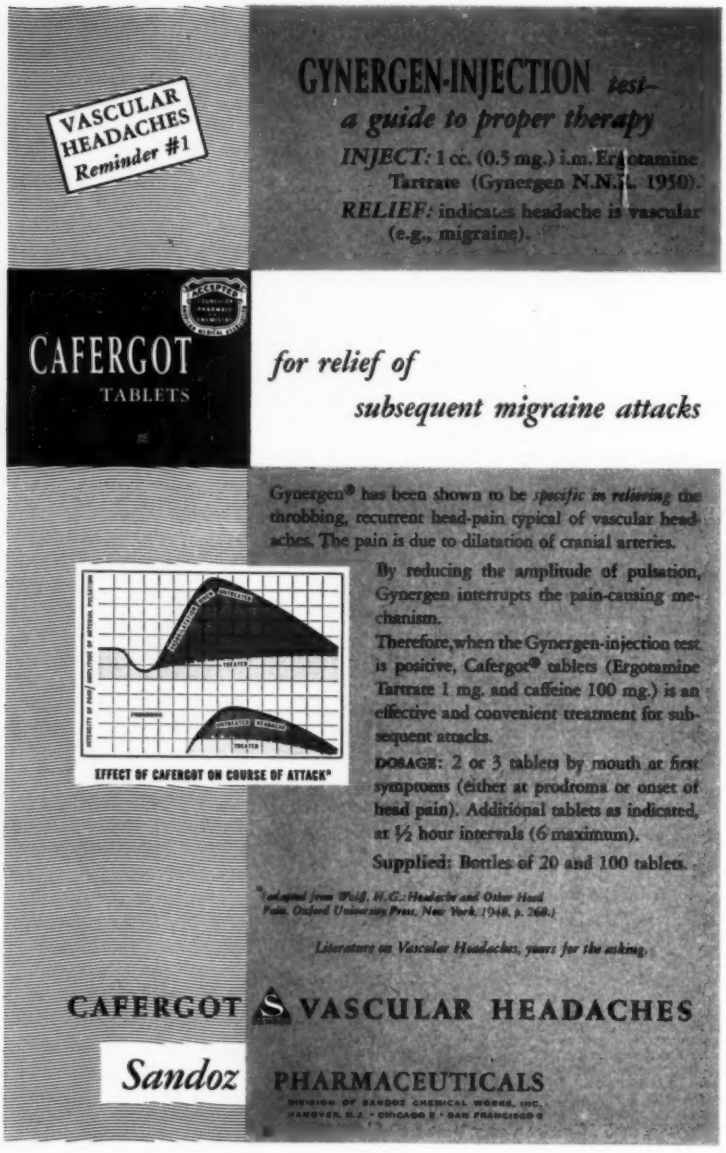
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reunion (including the integration) of health and medical care. The obvious purpose in appraising these trends is to apply them productively to plans for medical care.

3. We need an evaluation of social and medical pressures, tensions, and resistance in connection with illness in all its forms. What is the quality and quantity of these individual and communal phenomena emanating inside or outside of the hospital? Are they well based, honestly applied, and helpful? How much anxiety, as well as eagerness, is associated with them, and, if these pressures are well-founded, how shall we deal with the resistances which they may create? The answer to this question will take us beyond the realm of statistics. Workers in the field are constantly exposed to these manifestations and are sometimes caught between the proverbial millstones. This subject must be treated at the council table with statesmanlike understanding.

4. A practical formulation of the scientific requirements in the management of prolonged illness is needed. This refers both to medical necessity and to social necessity, evaluated with scientific accuracy wherever possible, but with the realization that a sick person must never be subjected to the rigid standards of the exact sciences. Scientific requirements go beyond the goal of certain well-meaning philanthropists who feel that food, shelter, and clothing (custodial care) are all that may be required by a person who has the misfortune of living under a prognosis of incurability.

5. We need a forceful statement on the menace of rigidity in hospital planning, and this refers to function as well as to structure. In particular, we must be alert to this menace when we plan for prolonged illness, because rigidity commits the hospital "in bricks and mortar" over a long period of years during which adaptations will undoubtedly be required. One of the architectural problems is how to get flexibility of design so that adjustments to changing conditions may subsequently be made easier.

6. We need a reaffirmation of the principle of individualization of care for patients under all circumstances. There is now the possibility of home care programs, which, in turn, stimulate greater interest in individualizing the care of patients who have no choice but to enter a hospital.

7. Among the supporting statements for the various items on this agenda should be a well-reasoned critique of the older and still prevailing methods of dealing with prolonged illness in homes, hospitals, and elsewhere. Only on the basis of such studies will revised plans for patient care find acceptance. We must be sure that we are dissatisfied with what we have and profit from experience before we adopt substitutes. A conservative point of view requires the strongest hypothesis to justify any kind of experimentation.

8. The criteria for admission to any hospital will have to be redefined and restated in the light of the deep-seated changes which the laboratories of modern medicine have been offering. Having emerged from the prescientific era, we are now in a position to get a better turnover of hospital beds or offer them to patients for longer periods, as necessary—so long, in fact, as they may have to remain close to the highly concentrated diagnostic and therapeutic facilities of the hospital. The new resource of home care can relieve the hospital of the necessity for retaining any other kind of patient within its walls.

9. As the policies which govern the admission of patients to general hospitals are rewritten, we should, at the same time, outline the criteria for the retention of the patient in his own home. Under what circumstances is he best cared for in this way?

10. Another item on the agenda is a recommendation on the criteria for the transfer of a patient, either from the hospital or from his home, to a substitute for his home. If a home for the aged, like a so-called home for incurables or a nursing home, should be a substitute for the patient's own home, then we should restate the conditions under which guests may be admitted and retained in these establishments. We must, however, keep in mind that these institutions are substitutes for the pa-

tient's home and never for the hospital.

11. The time has come to restate the special criteria for admission to homes for the aged. If we are to discontinue the practice of establishing so-called hospitals within homes for the aged, there is all the more reason for revising the conditions for admission. In the rare instances in which a home for the aged has been able successfully to establish a hospital within its walls, it has in fact added another hospital to the community. In order to establish a hospital within a home, the institution must be prepared to meet the challenging clinical problems which characterize prolonged illness and age in general. It should be able to absorb acute medical and surgical cases without further effort. Such an institution is indeed compelled to do this in emergencies. In connection with this item we must consider the relationship of a home for the aged, which as I have already pointed out is a substitute for the patient's own home, to the general hospital from which it should be able to draw medical sustenance.

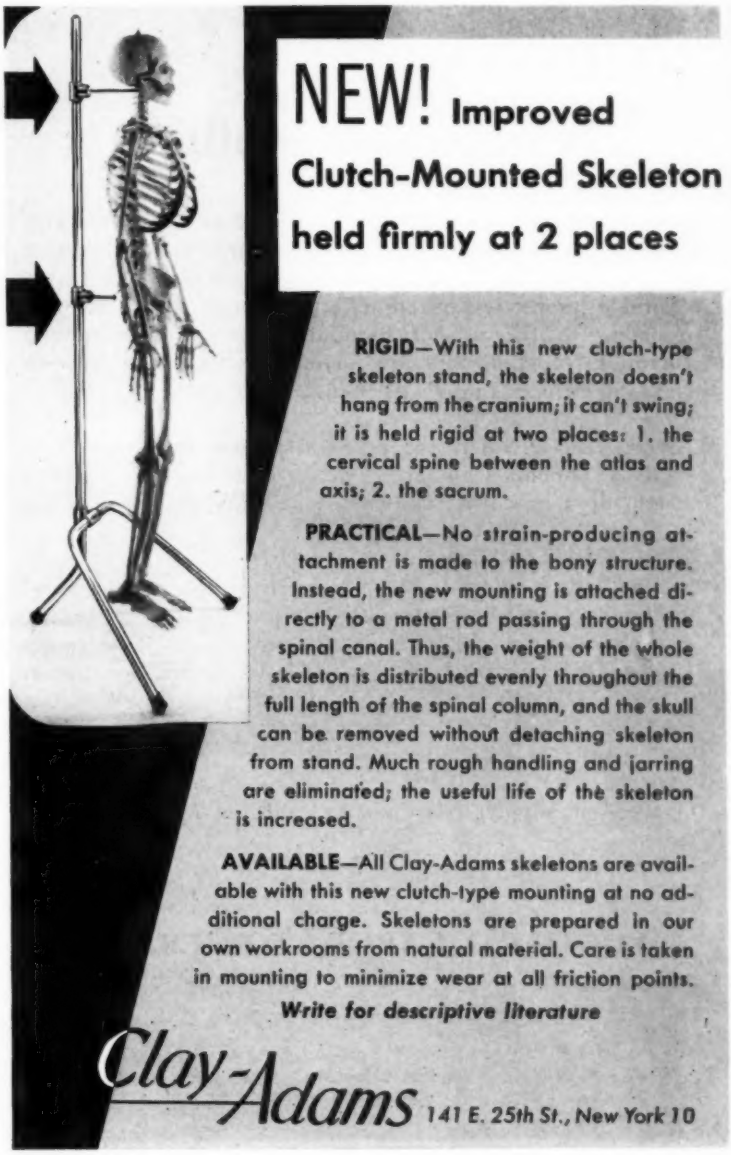
12. What criteria shall we recommend for admission to custodial establishments generally? These decisions should follow the lines recommended for an institutional home for the aged.

13. If, after careful study, we find that it is virtually impossible to maintain a convalescent establishment solely for this specific purpose, what shall we do about it? This establishment, too, is a substitute for the patient's home and not a substitute for the hospital. If a convalescent patient is safely on the road to partial or complete recovery from acute or chronic disease, his requirements will doubtless be about the same as those for anyone who is recuperating from overwork and seeks a change and rest on a farm, in mountainous areas, or at the seashore. We must not confuse the convalescent patient with any other type of patient, for if we do, we shall perpetuate a confused and distorted plan of medical care which makes of the convalescent institution a catchall establishment for the admission of patients (with the possible exception of mental and tuberculous patients) who may not be acceptable to the "acute" general hospital.

14. Though much is being said about the place of the tuberculous patient in the general hospital, we are still far from translating this principle into practice. How can the care of the tuberculous patient be integrated with the care of all other patients in the general hospital and what conditions should govern his admission? The active treatment of this disease, based on modern scientific knowledge, and the passive treatment, which characterized the care given previously and still being given, should be evaluated from this point of view.

15. Almost the same questions apply to the mental patient in the general hospital. What are the relative advantages of integration in a general hospital as compared with isolation and segregation in a distant special hospital? If integration is desirable, what is the best kind of experimental beginning and how can the hospital trustee be made receptive to such new ideas?

(To be continued in the April JOURNAL.*)*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BREAKING PATTERNS OF DEFEAT. The Effective Readjustment of the Sick Personality. By Richard L. Jenkins, M.D., Chief of Psychiatric Research, Psychiatry and Neurology Service, Veterans Administration, Washington, D.C. Cloth. Pp. 270. Price $6.75. J.

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THE PATHOLOGY OF TRAUMA. By Alan Richards Moritz, M.D., Professor of Pathology and Director of the Institute of Pathology of the School of Medicine of Western Reserve University, Cleveland, Ohio. Ed. 2. Cloth. Pp. 414, with illustrations. Price $8.50. Lea & Febiger, Washington Square, Philadelphia 6, 1954.

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ACUTE PULMONARY EDEMA. Modern Medical Monographs, 10. By Mark D. Altschule, M.D., Assistant Professor of Medicine, Harvard Medical School, and Visiting Physician, Beth Israel Hospital, Boston; Director of Internal Medicine and of Research in Clinical Physiology, McLean Hospital, Waverley, Mass. Cloth. Pp. 68. Price $3.50. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1954.

PELVIC RELAXATIONS AND HERNIATIONS. By James M. Wilson, M.D., Assistant Professor of Gynecology and Obstetrics, Medical College of South Carolina, Charleston, South Carolina. Publication Number 203, American Lecture Series. Edited by E. C. Hamblen, B.S., M.D., F.A.C.S., Professor of Endocrinology, Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine; Chief of the Division of Endocrinology and Endocrinologist, Duke Hospital, Durham, North Carolina. Cloth. Pp. 64, with illustrations. Price $2.75. Charles C Thomas, Publisher, 301-327 East Lawrence Ave., Springfield, Ill., 1954.

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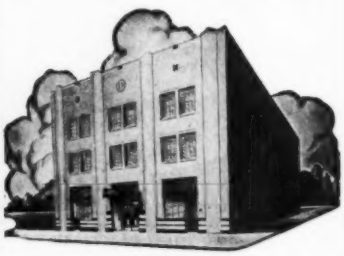

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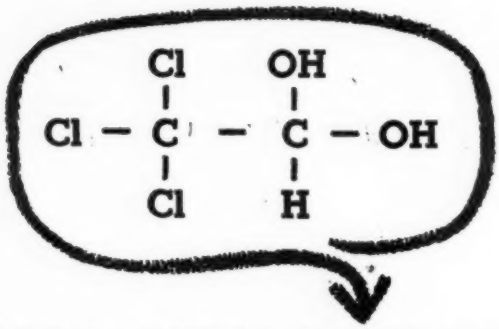

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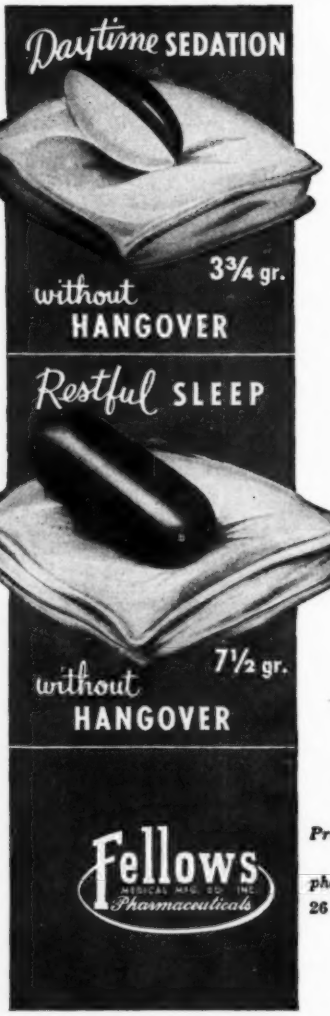

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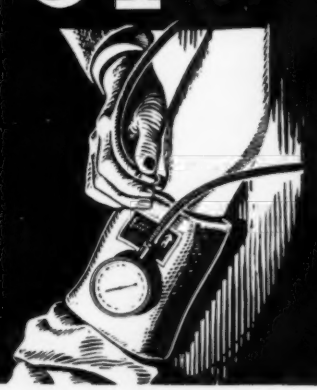

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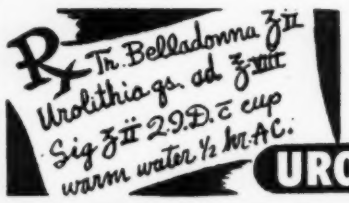

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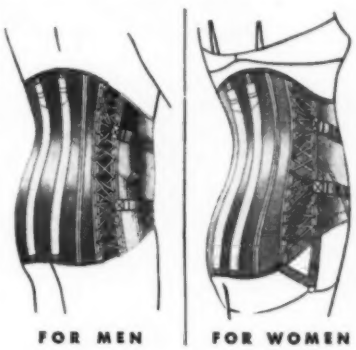

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Pabirin provides acetylsalicylic acid, widely regarded as the most efficacious and best tolerated of all salicylate compounds. In addition to 5 gr. each of aspirin and PABA, each capsule contains 50 mg. of ascorbic acid. Six capsules daily supply a full therapeutic dose of vitamin C to prevent excessive fall in the blood ascorbic acid level.

Each capsule now contains:

Acetylsalicylic acid.....5 gr.
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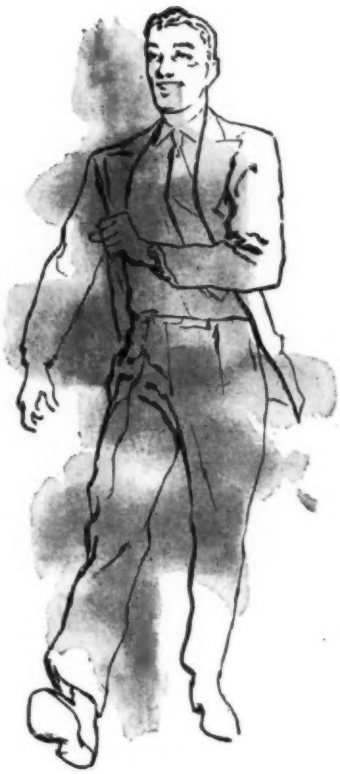

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a rapid decongestive effect[1]—"relief lasts for several hours"[2]—and a prolonged reduction of local swelling and congestion.[2]

Supply: 0.05% Solution, 1 oz. bottle and 15 ml. Nebulizer.

1. Hild, A. M.: Schweiz. med. Wchnschr. 71:557, 1941.
2. New and Nonofficial Remedies, J. B. Lippincott Co., Philadelphia, 1953, p. 200.

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